



## SEQUENCE LISTING

## (1) GENERAL INFORMATION:

- (i) APPLICANT: Suzuki, Shintaro
- (ii) TITLE OF INVENTION: Protocadherin Materials and Methods
- (iii) NUMBER OF SEQUENCES: 115
- (iv) CORRESPONDENCE ADDRESS:
  - (A) ADDRESSEE: Marshall, O'Toole, Gerstein, Murray, & Borun
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  - (C) CITY: Chicago
  - (D) STATE: Illinois
  - (E) COUNTRY: USA
  - (F) ZIP: 60606
- (v) COMPUTER READABLE FORM:
  - (A) MEDIUM TYPE: Floppy disk
  - (B) COMPUTER: IBM PC compatible
  - (C) OPERATING SYSTEM: PC-DOS/MS-DOS
  - (D) SOFTWARE: Patent In Release #1.0, Version #1.25
- (vi) CURRENT APPLICATION DATA:
  - (A) APPLICATION NUMBER:
  - (B) FILING DATE: 18 JUN 1998
  - (C) CLASSIFICATION:
- (vii) PRIOR APPLICATION DATA:
  - (A) APPLICATION NUMBER: US 08/263,161
  - (B) FILING DATE: 27 JUN 1994
- (viii) ATTORNEY/AGENT INFORMATION:
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  - (C) TELEX: 25-3856

## (2) INFORMATION FOR SEQ ID NO:1:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: DNA

17

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

17

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 131 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

AAGGGAGTGG	ACTTTGAGGA	GCAGCCTGAG	CTTAGTCTCA	TCCTCACGGC	TTTGGATGGA	60
GGGACTCCAT	CCAGGTCTGG	GA CTGCATTG	GTTCAAGTGG	AAGTCATAGA	TGCCAATGAC	120
AACGCACCGT	A					131

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 43 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Lys Gly Val Asp Phe Glu Glu Gln Pro Glu Leu Ser Leu Ile Leu Thr  
1 5 10 15

Ala Leu Asp Gly Gly Thr Pro Ser Arg Ser Gly Thr Ala Leu Val Gln  
20 25 30

Val Glu Val Ile Asp Ala Asn Asp Asn Ala Pro  
35 40

AAGCGACTGG ACTTTGAGAC CCTGCAGACC TTCGAGTTCA GCGTGGGTGC CACAGACCAT	60
GGCTCCCCCT CGCTCCGCAG TCAGGCTCTG GTGCGCGTGG TGGTGCTGGA CCACAATGAC	120
AATGCCCCCA A	131

Lys Gly Leu Asp Tyr Glu Ala Leu Gln Ser Phe Glu Phe Tyr Val Gly  
1 5 10 15

Ala Thr Asp Gly Gly Ser Pro Ala Leu Ser Ser Gln Thr Leu Val Arg  
                   20                                  25                                  30

Met Val Val Leu Asp Asp Asn Asp Asn Ala Pro  
                   35                                  40

(2) INFORMATION FOR SEQ ID NO:11:

- (i) SEQUENCE CHARACTERISTICS:  
     (A) LENGTH: 131 base pairs  
     (B) TYPE: nucleic acid  
     (C) STRANDEDNESS: single  
     (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

AAGGCGTTTG ATTTTGAGGA TCAGAGAGAG TTCCAGCTAA CCGCTCATAT AAACGACGGA           60

GGTACCCCGG TTTTGGCCAC CAACATCAGC GTGAACATAT TTGTTACTGA CCGCAATGAC           120

AACGCCCCGC A   131

(2) INFORMATION FOR SEQ ID NO:12:

- (i) SEQUENCE CHARACTERISTICS:  
     (A) LENGTH: 43 amino acids  
     (B) TYPE: amino acid  
     (C) STRANDEDNESS: single  
     (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

Lys Ala Phe Asp Phe Glu Asp Gln Arg Glu Phe Gln Leu Thr Ala His  
   1                  5                                  10                                  15

Ile Asn Asp Gly Gly Thr Pro Val Leu Ala Thr Asn Ile Ser Val Asn  
                   20                                  25                                  30

Ile Phe Val Thr Asp Arg Asn Asp Asn Ala Pro  
                   35                                  40

(2) INFORMATION FOR SEQ ID NO:13:

- (i) SEQUENCE CHARACTERISTICS:  
     (A) LENGTH: 131 base pairs  
     (B) TYPE: nucleic acid  
     (C) STRANDEDNESS: single  
     (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

```

AAGGCGGTGG ATTACGAAAT CACCAAGTCC TATGAGATAG ATGTTCAAGC CCAAGATCTG      60
GGTCCCAATT CTATTCCTGC TCATTGCAAA ATTATAATTA AGGTCGTGGA TGTCAACGAC      120
AACGCTCCCA A                                                                131

```

## (2) INFORMATION FOR SEQ ID NO:14:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 43 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

```

Lys Ala Val Asp Tyr Glu Ile Thr Lys Ser Tyr Glu Ile Asp Val Gln
1           5           10           15
Ala Gln Asp Leu Gly Pro Asn Ser Ile Pro Ala His Cys Lys Ile Ile
          20           25           30
Ile Lys Val Val Asp Val Asn Asp Asn Ala Pro
          35           40

```

## (2) INFORMATION FOR SEQ ID NO:15:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 135 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

```

TATGACCATG ATTACGAGAC AACCAAAGAA TATACACTGC GGATCCGGGC CCAGGATGGT      60
GGCCGGACTC CACTTTCCAA CGTCTCCGGT CTAGTAACCG TGCAGGTCCT AGACATCAAC      120
GACAATGCCC CCCCA                                                                135

```

## (2) INFORMATION FOR SEQ ID NO:16:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 44 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

Tyr Asp His Asp Tyr Glu Thr Thr Lys Glu Tyr Thr Leu Arg Ile Arg  
1 5 10 15

Ala Gln Asp Gly Gly Arg Thr Pro Leu Ser Asn Val Ser Gly Leu Val  
20 25 30

Thr Val Gln Val Leu Asp Ile Asn Asp Asn Ala Pro  
35 40

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 129 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

GGGGGGTCGA	TTACGAGGAG	AACGGCATGT	TAGAGATCGA	CGTGCAGGCC	AGAGACCTAG	60
GACCTAACCC	AATTCCAGCC	CATTGCAAGG	TCACAGTCAA	GCTCATCGAC	CGCAATGATA	120
ACGCCCCCA						129

(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 43 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

Arg Gly Val Asp Tyr Glu Glu Asn Gly Met Leu Glu Ile Asp Val Gln  
1 5 10 15

Ala Arg Asp Leu Gly Pro Asn Pro Ile Pro Ala His Cys Lys Val Thr  
20 25 30

Val Lys Leu Ile Asp Arg Asn Asp Asn Ala Pro  
35 40

(A) LENGTH: 131 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

AAGGGGTTGG	ACTACGAAGA	CACCAAACTC	CATGAGATTT	ACATCCAGGC	CAAAGACAAA	60
GGTGCCAATC	CGGAAGGAGC	GCATTGCAAA	GTACTGGTAG	AGGTTGTGGA	CGTTAACGAC	120
AATGCCCCCTC	A					131

(2) INFORMATION FOR SEQ ID NO:20:

(A) LENGTH: 43 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

Lys Gly Leu Asp Tyr Glu Asp Thr Lys Leu His Glu Ile Tyr Ile Gln  
1 5 10 15  
Ala Lys Asp Lys Gly Ala Asn Pro Glu Gly Ala His Cys Lys Val Leu  
20 25 30  
Val Glu Val Val Asp Val Asn Asp Asn Ala Pro  
35 40

(2) INFORMATION FOR SEQ ID NO:21:

(A) LENGTH: 131 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

AAGGGTTTGG	ACTTTGAGCA	AGTAGATGTC	TACAAAATCC	GCGTTGACGC	GACGGACAAA	60
GGACACCCCTC	CGATGGCAGG	CCATTGCACT	GTTTTAGTGA	GGGTATTGGA	TGAAAACGAC	120
AATGCGCCTC	T					131



## (2) INFORMATION FOR SEQ ID NO:22:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 43 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

```

Lys Gly Leu Asp Phe Glu Gln Val Asp Val Tyr Lys Ile Arg Val Asp
1           5           10           15

Ala Thr Asp Lys Gly His Pro Pro Met Ala Gly His Cys Thr Val Leu
          20           25           30

Val Arg Val Leu Asp Glu Asn Asp Asn Ala Pro
          35           40

```

## (2) INFORMATION FOR SEQ ID NO:23:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 134 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

```

AAGGGTATAG ACTTCGAGCA GATCAAGGAC TTCAGCTTTC AAGTGGAAGC CCGGGACGCC      60
GGCAGTCCCC AGGCGCTGTC CGGCAACTGC ACTGTCAACA TCTTGATAGT GGATCAGAAC      120
GACAACGCCC CTAA                                     134

```

## (2) INFORMATION FOR SEQ ID NO:24:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 44 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

```

Lys Gly Ile Asp Phe Glu Gln Ile Lys Asp Phe Ser Phe Gln Val Glu
1           5           10           15

```

Ala Arg Asp Ala Gly Ser Pro Gln Ala Leu Ala Gly Asn Thr Thr Val  
                   20                                  25                                  30

Asn Ile Leu Ile Val Asp Gln Asn Asp Asn Ala Pro  
                   35                                  40

## (2) INFORMATION FOR SEQ ID NO:25:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 134 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

AAGCCGTTTCG ACTATGAGCA AACCGCCAAC ACGCTGGCAC AGATTGACGC CGTGCTGGAA 60

AAACAGGGCA GCAATAAATC GAGCATTCTG GATGCCACCA TTTTCCTGGC CGATAAAAAC 120

GACAATGCGC CAGA 134

## (2) INFORMATION FOR SEQ ID NO:26:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 44 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

Lys Pro Phe Asp Tyr Glu Gln Thr Ala Asn Thr Leu Ala Gln Ile Asp  
   1                  5                                  10                                  15

Ala Val Leu Glu Lys Gln Gly Ser Asn Lys Ser Ser Ile Leu Asp Ala  
                   20                                  25                                  30

Thr Ile Phe Leu Ala Asp Lys Asn Asp Asn Ala Pro  
                   35                                  40

## (2) INFORMATION FOR SEQ ID NO:27:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 131 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

```

AAGCGGCTGG ATTTCTGAACA GTTCCAGCAG CACAAGCTGC TCGTAAGGGC TGTGATGGA      60
GGAATGCCGC CACTGAGCAG CGATGTGGTC GTCAGTGTGG ATGTCACCGA CCTCAACGAT      120
AACGCGCCCT A                                                                131

```

## (2) INFORMATION FOR SEQ ID NO:28:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 43 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

```

Lys Arg Leu Asp Phe Glu Gln Phe Gln Gln His Lys Leu Leu Val Arg
1              5              10              15
Ala Val Asp Gly Gly Met Pro Pro Leu Ser Ser Asp Val Val Val Thr
                20              25              30
Val Asp Val Thr Asp Leu Asn Asp Asn Ala Pro
          35              40

```

## (2) INFORMATION FOR SEQ ID NO:29:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 131 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

```

AAGGGGATAG ACTTTGAGAG TGAGAATTAC TATGAATTTG ATGTGCGGGC TCGCGATGGG      60
GGTTCTCCAG CCATGGAGCA ACATTGCAGC CTTGAGTGG ATCTGCTGGA CGTAAATGAC      120
AACGCCCCAC T                                                                131

```

## (2) INFORMATION FOR SEQ ID NO:30:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 43 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

```

Lys Gly Ile Asp Phe Glu Ser Glu Asn Tyr Tyr Glu Phe Asp Val Arg
1           5           10           15
Ala Arg Asp Gly Gly Ser Pro Ala Met Glu Gln His Cys Ser Leu Arg
                20           25           30
Val Asp Leu Leu Asp Val Asn Asp Asn Ala Pro
        35           40

```

(2) INFORMATION FOR SEQ ID NO:31:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 131 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

```

AAGGCATTGG ACTTTGAGGC CCGGCGACTG TATTCGCTGA CAGTTCAGGC CACGGACCGA      60
GGCGTGCCCT CGCTCACCGG GCGTGCCGAA GCGCTTATCC AGCTGCTAGA TGTCAACGAC      120
AACGCACCCA T                                131

```

(2) INFORMATION FOR SEQ ID NO:32:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 43 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

```

Lys Ala Leu Asp Phe Glu Ala Arg Arg Leu Tyr Ser Leu Thr Val Gln
1           5           10           15
Ala Thr Asp Arg Gly Val Pro Ser Leu Thr Gly Arg Ala Glu Ala Leu
        20           25           30
Ile Gln Leu Leu Asp Val Asn Asp Asn Ala Pro
        35           40

```

## (2) INFORMATION FOR SEQ ID NO:33:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 125 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

```

AAGCCAATTG ATTACGAGGC AACTCCATAC TATAACATGG AAATTGTAGC CACAGACAGC      60
GGAGGTCTTT CGGGAAAATG CACTGTGTCT ATACAGGTGG TGGATGTGAA CGACAACGCC      120
CCCAA                                           125

```

## (2) INFORMATION FOR SEQ ID NO:34:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 41 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

```

Lys Pro Ile Asp Tyr Glu Ala Thr Pro Tyr Tyr Asn Met Glu Ile Val
1           5           10           15
Ala Thr Asp Ser Gly Gly Leu Ser Gly Lys Cys Thr Val Ser Ile Gln
          20           25           30
Val Val Asp Val Asn Asp Asn Ala Pro
          35           40

```

## (2) INFORMATION FOR SEQ ID NO:35:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 446 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

```

AAGCGGGTAG ACTTCGAAAT GTGCAAAGA TTTTACCTTG TGGTGGAAGC TAAAGACGGA      60
GGCACCCCAG CCCTCAGCAC GGCAGCCACT GTCAGCATCG ACCTCACAGA TGTGAATGAT      120

```

```

AACCCCTCCTC GGTTCAGCCA AGATGTCTAC AGTGCTGTCA TCAGTGAGGA TGCCTTAGAG      180
GGGGACTCTG TCATTCTGCT GATAGCAGAA GATGTGGATA GCAAGCCTAA TGGACAGATT      240
CGGTTTTCCA TCGTGGGTGG AGATAGGGAC AATGAATTTG CTGTCGATCC AATCTTGGGA      300
CTTGTGAAAG TTAAGAAGAA ACTGGACCGG GAGCGGGTGT CAGGATACTC CCTGCTCATC      360
CAGGCAGTAG ATAGTGGCAT TCCTGCAATG TCCTCAACGA CAACTGTCAA CATTGATATT      420
TCTGATGTGA ACGACAACGC CCCCCT      446

```

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 148 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

```

Lys Arg Val Asp Phe Glu Met Cys Lys Arg Phe Tyr Leu Val Val Glu
1           5           10           15
Ala Lys Asp Gly Gly Thr Pro Ala Leu Ser Thr Ala Ala Thr Val Ser
20           25           30
Ile Asp Leu Thr Asp Val Asn Asp Asn Pro Pro Arg Phe Ser Gln Asp
35           40           45
Val Tyr Asp Ala Val Ile Ser Glu Asp Ala Leu Glu Gly Asp Ser Val
50           55           60
Ile Leu Leu Ile Ala Glu Asp Val Asp Ser Lys Pro Asn Gly Gln Ile
65           70           75           80
Arg Phe Ser Ile Val Gly Gly Asp Arg Asp Asn Glu Phe Ala Val Asp
85           90           95
Pro Ile Leu Gly Leu Val Lys Val Lys Lys Lys Leu Asp Arg Glu Arg
100          105          110
Val Ser Gly Tyr Ser Leu Leu Ile Gln Ala Val Asp Ser Gly Ile Pro
115          120          125
Ala Met Ser Ser Thr Thr Thr Val Asn Ile Asp Ile Ser Asp Val Asn
130          135          140
Asp Asn Ala Pro
145

```

## (2) INFORMATION FOR SEQ ID NO:37:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 440 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

```

AAGGGGGTTG ATTATGAGAC AAACCCACGG CTACGACTGG TGCTACAGGC AGAGAGTGGA      60
GGAGCCTTTG CTTTCTCGGT GCTGACCCTG ACCCTTCAAG ATGCCAATGA CAATGCTCCC      120
CGTTTCCTGC AGCCTCACTA CGTGGCTTTC CTGCCAGAGT CCCGACCCTT GGAAGGGCCC      180
CTGCTGCAGG TGGAAGCAGA CGACCTGGAT CAAGGCTCTG GAGGACAGAT CTCCTACAGT      240
CTGGCTGCAT CCCAGCCAGC ACGGGGCTTG TTCCATGTAG ACCCAGCCAC AGGCACTATC      300
ACTACCACAG CCATCCTGGA CCGGGAAATC TGGGCTGAAA CACGGCTGGT ACTGATGGCC      360
ACAGACAGAG GAAGCCCAGC ATTGGTGGGC TCAGCTACCC TGACAGTGAT GGTCATCGAT      420
ACCAACGACA ATGCTCCCCT                                     440

```

## (2) INFORMATION FOR SEQ ID NO:38:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 146 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

```

Lys Gly Val Asp Tyr Glu Thr Asn Pro Arg Leu Arg Leu Val Leu Gln
1           5           10           15
Ala Glu Ser Gly Gly Ala Phe Ala Phe Ser Val Leu Thr Leu Thr Leu
20           25           30
Gln Asp Ala Asn Asp Asn Ala Pro Arg Phe Leu Gln Pro His Tyr Val
35           40           45
Ala Phe Leu Pro Glu Ser Arg Pro Leu Glu Gly Pro Leu Leu Gln Val
50           55           60
Glu Ala Asn Asp Leu Asp Gln Gly Ser Gly Gly Gln Ile Ser Tyr Ser
65           70           75           80
Leu Ala Ala Ser Gln Pro Ala Arg Gly Leu Phe His Val Asp Pro Ala
85           90           95

```

Thr Gly Thr Ile Thr Thr Thr Ala Ile Leu Asp Arg Glu Ile Trp Ala  
                     100                    105                    110  
 Glu Thr Arg Leu Val Leu Met Ala Thr Asp Arg Gly Ser Pro Ala Leu  
                     115                    120                    125  
 Val Gly Ser Ala Thr Leu Thr Val Met Val Ile Asp Thr Asn Asp Asn  
                     130                    135                    140  
 Ala Pro  
 145

(2) INFORMATION FOR SEQ ID NO:39:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 124 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

AAGGTCTCGA TTATGAGGCA ACTCCATATT ATAACGTGGA AATTGTAGCC ACAGATGGTG 60  
 GGGGCCTTTC AGGAAAATGC ACTGTGGCTA TAGAAGTGGT GGATGTGAAC GACGGCGCTC 120  
 CAAT 124

(2) INFORMATION FOR SEQ ID NO:40:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 41 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

Lys Gly Leu Asp Tyr Glu Ala Thr Pro Tyr Tyr Asn Val Glu Ile Val  
 1                    5                    10                    15  
 Ala Thr Asp Gly Gly Ala Phe Asp Glu Asn Cys Thr Val Ala Ile Glu  
                     20                    25                    30  
 Val Val Asp Val Asn Asp Asn Ala Pro  
                     35                    40



## (2) INFORMATION FOR SEQ ID NO:41:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 8 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

Asp Xaa Asn Glu Xaa Pro Xaa Phe  
 1 5

## (2) INFORMATION FOR SEQ ID NO:42:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 8 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

Asp Xaa Asp Glu Xaa Pro Xaa Phe  
 1 5

## (2) INFORMATION FOR SEQ ID NO:43:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 9 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

Asp Xaa Asn Asp Asn Xaa Pro Xaa Phe  
 1 5

## (2) INFORMATION FOR SEQ ID NO:44:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 131 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

AAGCGGATGG ATTTTGAAGA CACCAAACCTC CATGAGATTT ACATCCAGGC CAAAGACAAA 60  
 GGTGCCAATC CCGAAGGAGC GCATTGCAAA GTACTTGTAG AGGTTGTAGA CGTAAACGAC 120  
 AACGCCCCAG T 131

## (2) INFORMATION FOR SEQ ID NO:45:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 43 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

Leu Arg Met Asp Phe Glu Asp Thr Lys Leu His Glu Ile Tyr Ile Gln  
 1                      5                      10                      15  
 Ala Lys Asp Lys Gly Ala Asn Pro Glu Gly Ala His Cys Lys Val Leu  
                     20                      25                      30  
 Val Glu Val Val Asp Val Asn Asp Asn Ala Pro  
                     35                      40

## (2) INFORMATION FOR SEQ ID NO:46:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 131 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

AAGGCTTTGG ATTACGAGGA TCAGAGAGAG TTCCAATAA CAGCTCATAT AAACGACGGA 60  
 GGTACCCCAG TCTTAGCCAC CAACATCAGC GTGAACGTAT TTGTTACTGA CCGCAATGAT 120  
 AACGCCCCCT A 131

## (2) INFORMATION FOR SEQ ID NO:47:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 43 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

```

Lys Ala Leu Asp Tyr Glu Asp Gln Arg Glu Phe Gln Leu Thr Ala His
1           5           10           15
Ile Asn Asp Gly Gly Thr Pro Val Leu Ala Thr Asn Ile Ser Val Asn
          20           25           30
Val Phe Val Thr Asp Arg Asn Asp Asn Ala Pro
          35           40

```

(2) INFORMATION FOR SEQ ID NO:48:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 131 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

```

AAGCGCTTGG ACTACGAGGA GAGTAACAAT TATGAAATTC ACGTGGATGC TACAGATAAA      60
GGATACCCAC CTATGGTTGC TCACTGCACC GTACTCGTGG GAATCTTGGA TGAAAATGAC      120
AACGCACCCA T                                     131

```

(2) INFORMATION FOR SEQ ID NO:49:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 43 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

```

Lys Arg Leu Asp Tyr Glu Glu Ser Asn Asn Tyr Glu Ile His Val Asp
1           5           10           15
Ala Thr Asp Lys Gly Tyr Pro Pro Met Val Ala His Cys Thr Val Leu
          20           25           30
Val Gly Ile Leu Asp Glu Asn Asp Asn Ala Pro
          35           40

```

## (2) INFORMATION FOR SEQ ID NO:50:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 131 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

```

AAACCGGTGG ACTACGAGAA AGTCAAAGAC TATACCATCG AGATCGTGGC TGTGGATTCC      60
GGCAACCCCTC CACTCTCTAG CACCAACTCC CTCAAGGTGC AGGTGGTAGA CGTCAACGAT      120
AACGCCCTC T                                     131
  
```

## (2) INFORMATION FOR SEQ ID NO:51:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 43 amino acids  
 (B) TYPE: amino acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

```

Lys Pro Val Asp Tyr Glu Lys Val Lys Asp Tyr Thr Ile Glu Ile Val
1           5           10           15
Ala Val Asp Ser Gly Asn Pro Pro Leu Ser Ser Thr Asn Ser Leu Lys
20          25          30
Val Gln Val Val Asp Val Asn Asp Asn Ala Pro
35          40
  
```

## (2) INFORMATION FOR SEQ ID NO:52:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 131 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

```

AAGCCTTTTG ATTTGAGGA CACCAAATC CATGAGATTT ACATCCAGGC CAAAGACAAG      60
GGCGCCAATC CCGAAGGAGC ACATTGCAAA GTGTTGGTGG AGGTTGTGGA TGTGAACGAC      120
  
```

AATGCCCTC A

(2) INFORMATION FOR SEQ ID NO:53:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 43 amino acids  
 (B) TYPE: amino acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:53:

Lys	Pro	Phe	Asp	Phe	Glu	Asp	Thr	Lys	Leu	His	Glu	Ile	Tyr	Ile	Gln
1				5					10					15	
Ala	Lys	Asp	Lys	Gly	Ala	Asn	Pro	Glu	Gly	Ala	His	Cys	Lys	Val	Leu
			20					25					30		
Val	Glu	Val	Val	Asp	Val	Asn	Asp	Asn	Ala	Pro					
			35					40							

(2) INFORMATION FOR SEQ ID NO:54:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 122 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:54:

AAAGGTGTCG ATTACGAGGT GAGTCCACGG CTGCGACTGG TGCTGCAGGC AGAGAGTCGA	60
GGAGCCTTTG CCTTCACTGT GCTGACCCTG ACCCTGCAAG ATGCCAACGA CAACGCCCCG	120
AG	122

(2) INFORMATION FOR SEQ ID NO:55:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 40 amino acids  
 (B) TYPE: amino acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:55:

Lys	Gly	Val	Asp	Tyr	Glu	Val	Ser	Pro	Arg	Leu	Arg	Leu	Val	Leu	Gln
1						5			10					15	

Ala Glu Ser Arg Gly Ala Phe Ala Phe Thr Val Leu Thr Leu Thr Leu  
                   20                                  25                                  30

Gln Asp Ala Asn Asp Asn Ala Pro  
                   35                                  40

(2) INFORMATION FOR SEQ ID NO:56:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 131 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:56:

AAAGGGATTG ATTACGAGCA GTTGAGAGAC CTACAGCTGT GGGTGACAGC CAGCGACAGC       60  
 GGGGACCCGC CTCTTAGCAG CAACGTGTCA CTGAGCCTGT TTGTGCTGGA CCAGAACGAC       120  
 AACGCCCCCC T   131

(2) INFORMATION FOR SEQ ID NO:57:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 43 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

Lys Gly Ile Asp Tyr Glu Gln Leu Arg Asp Leu Gln Leu Trp Val Thr  
   1                  5                                  10                                  15  
 Ala Ser Asp Ser Gly Asp Pro Pro Leu Ser Ser Asn Val Ser Leu Ser  
                   20                                  25                                  30  
 Leu Phe Val Leu Asp Gln Asn Asp Asn Ala Pro  
                   35                                  40

(2) INFORMATION FOR SEQ ID NO:58:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 125 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

AAGGCGGTCG ATTTTGAGCG CACATCCTCT TATCAACTCA TCATTCAGGC CACCAATATG 60  
 GCAGGAATGG CTTCCAATGC TACAGTCAAT ATTCAGATTG TTGATGAAAA CGACAACGCC 120  
 CCCCCA 125

## (2) INFORMATION FOR SEQ ID NO:59:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 41 amino acids  
 (B) TYPE: amino acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

Lys Ala Val Asp Phe Glu Arg Thr Ser Ser Tyr Gln Leu Ile Ile Gln  
 1 5 10 15  
 Ala Thr Asn Met Ala Gly Met Ala Ser Asn Ala Thr Val Asn Ile Gln  
 20 25 30  
 Ile Val Asp Glu Asn Asp Asn Ala Pro  
 35 40

## (2) INFORMATION FOR SEQ ID NO:60:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 131 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:60:

AAACGGCTAG ACTTTGAAAA GATACAAAAA TATGTTGTAT GGATAGAGGC CAGAGATGGT 60  
 GGTTTCCCTC CTTTCTCCTC TTACGAGAAA CTTGATATAA CAGTATTAGA TGTCAACGAT 120  
 AACGCGCCTA A 131

## (2) INFORMATION FOR SEQ ID NO:61:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 43 amino acids  
 (B) TYPE: amino acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:61:

```

Lys Arg Leu Asp Phe Glu Lys Ile Gln Lys Tyr Val Val Trp Ile Glu
1           5           10           15
Ala Arg Asp Gly Gly Phe Pro Pro Phe Ser Ser Tyr Glu Lys Leu Asp
          20           25           30
Ile Thr Val Leu Asp Val Asn Asp Asn Ala Pro
          35           40

```

(2) INFORMATION FOR SEQ ID NO:62:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 131 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:62:

```

AAGGGGATCG ATTATGAGAA GGTCAAAGAC TACACCATTG AGATTGTGGC TGTGGACTCT      60
GGCAACCCCC CACTCTCCAG CACTAACTCC CTCAAGGTGC AGGTGGTGGA CGTCAATGAC      120
AACGCACCGT G                                     131

```

(2) INFORMATION FOR SEQ ID NO:63:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 43 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:63:

```

Lys Gly Ile Asp Tyr Glu Lys Val Lys Asp Tyr Thr Ile Glu Ile Val
1           5           10           15
Ala Val Asp Ser Gly Asn Pro Pro Leu Ser Ser Thr Asn Ser Leu Lys
          20           25           30
Val Gln Val Val Asp Val Asn Asp Asn Ala Pro
          35           40

```



## (2) INFORMATION FOR SEQ ID NO:64:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 131 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:64:

```

AAGGGACTCG ACTACGAGGA TCGGCGGGAA TTTGAATTAA CAGCTCATAT CAGCGATGGG      60
GGCACCCCGG TCCTAGCCAC CAACATCAGC GTGAACATAT TTGTCACTGA TCGCAACGAT      120
AATGCCCCCG T                                     131

```

## (2) INFORMATION FOR SEQ ID NO:65:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 43 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:65:

```

Lys Gly Leu Asp Tyr Glu Asp Arg Arg Glu Phe Glu Leu Thr Ala His
1           5           10           15
Ile Ser Asp Gly Gly Thr Pro Val Leu Ala Thr Asn Ile Ser Val Asn
20          25          30
Ile Phe Val Thr Asp Arg Asn Asp Asn Ala Pro
35          40

```

## (2) INFORMATION FOR SEQ ID NO:66:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 470 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:66:

```

AAGGGTTTGG ACTACGAGAC CACACAGGCC TACCAGCTCA CGGTCAACGC CACAGATCAA      60
GACAACACCA GGCCTCTGTC CACCCTGGCC AACTTGGCCA TCATCATCAC AGATGTCCAG      120

```

GACATGGACC CCATCTTCAT CAACCTGCCT TACAGCACCA ACATCTACGA GCATTCTCCT 180  
 CCGGGCACGA CGGTGCGCAT CATCACCGCC ATAGACCAGG ATCAAGGACG TCCCCGGGGC 240  
 ATTGGCTACA CCATCGTTTC AGGGAATACC AACAGCATCT TTGCCCTGGA CTACATCAGC 300  
 GGAGTGCTGA CCTTGAATGG CCTGCTGGAC CGGGAGAACC CCCTGTACAG CCATGGCTTC 360  
 ATCCTGACTG TGAAGGGCAC GGAGCTGAAC GATGACCGCA CCCCATCTGA CGCTACAGTC 420  
 ACCACGACCT TCAATATCCT GGTTATTGAC ATCAACGACA ACGCCCCACT 470

(2) INFORMATION FOR SEQ ID NO:67:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 156 amino acids  
 (B) TYPE: amino acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:67:

Lys Gly Leu Asp Tyr Glu Thr Thr Gln Ala Tyr Gln Leu Thr Val Asn  
 1 5 10 15  
 Ala Thr Asp Gln Asp Asn Thr Arg Pro Leu Ser Thr Leu Ala Asn Leu  
 20 25 30  
 Ala Ile Ile Ile Thr Asp Val Gln Asp Met Asp Pro Ile Phe Ile Asn  
 35 40 45  
 Leu Pro Tyr Ser Thr Asn Ile Tyr Glu His Ser Pro Pro Gly Thr Thr  
 50 55 60  
 Val Arg Ile Ile Thr Ala Ile Asp Gln Asp Gln Gly Arg Pro Arg Gly  
 65 70 75 80  
 Ile Gly Tyr Thr Ile Val Ser Gly Asn Thr Asn Ser Ile Phe Ala Leu  
 85 90 95  
 Asp Tyr Ile Ser Gly Val Leu Thr Leu Asn Gly Leu Leu Asp Arg Glu  
 100 105 110  
 Asn Pro Leu Tyr Ser Gly Gly Phe Ile Leu Thr Val Lys Gly Thr Glu  
 115 120 125  
 Leu Asn Asp Asp Arg Thr Pro Ser Asp Ala Thr Val Thr Thr Thr Phe  
 130 135 140  
 Asn Ile Leu Val Ile Asp Ile Asn Asp Asn Ala Pro  
 145 150 155

## (2) INFORMATION FOR SEQ ID NO:68:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 131 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:68:

```

AAGGGGGTCG ATTACGAGGT ACTACAGGCC TTTGAGTTCC ACGTGAGCGC CACAGACCGA      60
GGCTCACCGG GGCTCAGCAG CCAGGCTCTG GTGCGCGTGG TGGTGCTGGA CGACAATGAC      120
AACGCTCCCG T                                                                131

```

## (2) INFORMATION FOR SEQ ID NO:69:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 43 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:69:

```

Lys Gly Val Asp Tyr Glu Val Leu Gln Ala Phe Glu Phe His Val Ser
1           5           10           15
Ala Thr Asp Arg Gly Ser Pro Gly Leu Ser Ser Gln Ala Leu Val Arg
          20           25           30
Val Val Val Leu Asp Asp Asn Asp Asn Ala Pro
          35           40

```

## (2) INFORMATION FOR SEQ ID NO:70:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 131 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:70:

```

AAGGGGCTGG ATTATGAGCA GTTCCAGACC CTACAACTGG GAGTGACCGC TAGTGACAGT      60
GGAAACCCAC CATTAAGAAG CAATATTTCA CTGACCCTTT TCGTGCTGGA CCAGAATGAT      120

```

AACGCCCCAA A

131

## (2) INFORMATION FOR SEQ ID NO:71:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 43 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:71:

```

Lys Gly Leu Asp Tyr Glu Gln Phe Gln Thr Leu Gln Leu Gly Val Thr
1           5           10           15
Ala Ser Asp Ser Gly Asn Pro Pro Leu Arg Ser Asn Ile Ser Leu Thr
                20           25           30
Leu Phe Val Leu Asp Gln Asn Asp Asn Ala Pro
                35           40

```

## (2) INFORMATION FOR SEQ ID NO:72:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 131 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:72:

```

AAGCGGGTTG ATTACGAGGA TGTCCAGAAA TACTCGCTGA GCATTAAGGC CCAGGATGGG      60
CGGCCCCCGC TCATCAATTC TTCAGGGGTG GTGTCTGTGC AGGTGCTGGA TGTC AACGAC      120
AATGCCCCGG A                                     131

```

## (2) INFORMATION FOR SEQ ID NO:73:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 43 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:73:

```

Lys Arg Val Asp Tyr Glu Asp Val Gln Lys Tyr Ser Leu Ser Ile Lys
1           5           10           15

```

Ala Gln Asp Gly Arg Pro Pro Leu Ile Asn Ser Ser Gly Val Val Ser  
                   20                                  25                                  30

Val Gln Val Leu Asp Val Asn Asp Asn Ala Pro  
                   35                                  40

(2) INFORMATION FOR SEQ ID NO:74:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 125 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:74:

AAACCGGTAG ACTTTGAGCT ACAGCAGTTC TATGAAGTAG CTGTGGTGGC TTGGAAGTCT 60  
 GAGGGATTTC ATGTCAAAAAG GGCATTAAA GTGCAACTTT TAGATGACAA CGACAATGCC 120  
 CCGAT 125

(2) INFORMATION FOR SEQ ID NO:75:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 41 amino acids  
 (B) TYPE: amino acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:75:

Lys Pro Val Asp Phe Glu Leu Gln Gln Phe Tyr Glu Val Ala Val Val  
 1                  5                                  10                                  15  
 Ala Trp Asn Ser Glu Gly Phe His Val Lys Arg Val Ile Lys Val Gln  
                   20                                  25                                  30  
 Leu Leu Asp Asp Asn Asp Asn Ala Pro  
                   35                                  40

(2) INFORMATION FOR SEQ ID NO:76:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 125 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:76:

```
AAGGGATTAG ATTTTGAAAC TTTGCCCAT TACACATTGA TAATACAAGG AACTAACATG      60
GCTGGTTTGT CCACTAATAC AACGGTTCTA GTTCACTTGC AGGATGAGAA TGATAACGCC      120
CCAAA                                         125
```

(2) INFORMATION FOR SEQ ID NO:77:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 41 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:77:

```
Lys Gly Leu Asp Phe Glu Thr Leu Pro Ile Tyr Thr Leu Ile Ile Gln
1          5          10          15
Gly Thr Asn Met Ala Gly Leu Ser Thr Asn Thr Thr Val Leu Val His
          20          25          30
Leu Gln Asp Glu Asn Asp Asn Ala Pro
          35          40
```

(2) INFORMATION FOR SEQ ID NO:78:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 134 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:78:

```
AAGCGGGCGG ATTTGAGGC GATCCGGGAG TACAGTCTGA GGATCAAAGC GCAGGACGGG      60
GGGCGGCCTC CCCTCAGCAA CACCACGGGC ATGGTCACAG TGCAGGTCGT GGACGTCAAT      120
GACAACGCAC CCCT                                         134
```

(2) INFORMATION FOR SEQ ID NO:79:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 44 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:79:

```

Lys Arg Ala Asp Phe Glu Ala Ile Arg Glu Tyr Ser Leu Arg Ile Lys
1          5          10          15
Ala Gln Asp Gly Gly Arg Pro Pro Leu Ser Asn Thr Thr Gly Met Val
          20          25          30
Thr Val Gln Val Val Asp Val Asn Asp Asn Ala Pro
          35          40

```

(2) INFORMATION FOR SEQ ID NO:80:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 131 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:80:

```

AAGCGGTTGG ATTACGAAAA GGCATCGGAA TATGAAATCT ATGTTCAAGC CGCTGACAAA      60
GGCGCTGTCC CTATGGCTGG CCATTGCAAA GTGTTGCTGG AGATCGTGGA TGTCAACGAC      120
AACGCCCCCT T                                     131

```

(2) INFORMATION FOR SEQ ID NO:81:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 43 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:81:

```

Lys Arg Leu Asp Tyr Glu Lys Ala Ser Glu Tyr Glu Ile Tyr Val Gln
1          5          10          15
Ala Ala Asp Lys Gly Ala Val Pro Met Ala Gly His Cys Lys Val Leu
          20          25          30
Leu Glu Ile Val Asp Val Asn Asp Asn Ala Pro
          35          40

```

## (2) INFORMATION FOR SEQ ID NO:82:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 131 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:82:

```

AAGGGGATCG ATTATGAGGA TCAGGTCTCT TACACATTAG CAGTAACAGC ACATGACTAT      60
GGCATCCCTC AAAAATCAGA CACTACCTAT TTGGAAATCT TAGTAATTGA TGTTAACGAC      120
AACGCGCCCC A                                                              131

```

## (2) INFORMATION FOR SEQ ID NO:83:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 43 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:83:

```

Lys Gly Ile Asp Tyr Glu Asp Gln Val Ser Tyr Thr Leu Ala Val Thr
1           5           10           15
Ala His Asp Tyr Gly Ile Pro Gln Lys Ser Asp Thr Thr Tyr Leu Glu
20          25          30
Ile Leu Val Ile Asp Val Asn Asp Asn Ala Pro
35          40

```

## (2) INFORMATION FOR SEQ ID NO:84:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 131 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:84:

```

AAAGGGTTAG ATTTGAGGG CACTAAAGAT TCAGCGTTTA AAATAGTGGC AGCTGACACA      60
GGGAAGCCCA GCCTCAACCA GACAGCCCTG GTGAGAGTAG AGCTGGAGGA TGAGAACGAC      120

```



(2) INFORMATION FOR SEQ ID NO:85:

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:85:

Val Glu Leu Glu Asp Glu Asn Asp Asn Ala Pro  
35 40

(2) INFORMATION FOR SEQ ID NO:86:

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:86:

AAGGGTGTGG ATTTTGAAAG TGTGCGTAGC TACAGGCTGG TTATTCGTGC TCAAGATGGA 60  
 GGCAGCCCCCT CCAGAAGTAA CACCACCCAG CTCTTGGTCA ACGTCATCGA TCGAATGACA 120  
 ATGCGCCGCT 130

(2) INFORMATION FOR SEQ ID NO:87:

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:87:

Lys Gly Val Asp Phe Glu Ser Val Arg Ser Tyr Arg Leu Val Ile Arg  
1 5 10 15

Ala Gln Asp Gly Gly Ser Pro Ser Arg Ser Asn Thr Thr Gln Leu Leu  
                   20                                  25                                  30  
 Val Asn Val Ile Asp Val Asn Asp Asn Ala Pro  
                   35                                  40

## (2) INFORMATION FOR SEQ ID NO:88:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 131 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:88:

AAGGGTGTGG ACTTCGAGCT GACACATCTG TATGAGATTT GGATTGAGGC TGCCGATGGA 60  
 GACACGCCAA GTCTGCGTAG TGTAACCTTT ATAACGCTCA ACGTAACGGA TGCCAATGAC 120  
 AATGCTCCCA A 131

## (2) INFORMATION FOR SEQ ID NO:89:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 43 amino acids  
 (B) TYPE: amino acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:89:

Lys Gly Val Asp Phe Glu Leu Thr His Leu Tyr Glu Ile Trp Ile Glu  
   1                  5                                  10                                  15  
 Ala Ala Asp Gly Asp Thr Pro Ser Leu Arg Ser Val Thr Leu Ile Thr  
                   20                                  25                                  30  
 Leu Asn Val Thr Asp Ala Asn Asp Asn Ala Pro  
                   35                                  40

## (2) INFORMATION FOR SEQ ID NO:90:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 441 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:90:

```

CAAGGCGTTT GATTTTGAAG AGACAAGTAG ATATGTGTTG AGTGTGGAAG CTAAGGATGG      60
AGGAGTACAC ACAGCTCACT GTAATGTTCA AATAGAAATT GTTGACGAGA ATGACAATGC      120
CCCAGAGGTG ACATTCATGT CCTTCTCTAA CCAGATTCCA GAGGATTCAG ACCTTGAAC      180
TGTAATAGCC CTCATAAAG TGCAGACAA GGATTCTGGG CAAAATGGCA TGGTGACATG      240
CTATACTCAG GAAGAAGTTC CTTTCAAATT AGAATCCACC TCGAAGAATT ATTACAAGCT      300
GGTGATTGCT GGAGCCCTAA ACCGGGAGCA GACAGCAGAC TACAACGTCA CAATCATAGC      360
CACCGACAAG GGCAAACAG CCCTTCTCTC CAGGACAAGC ATCACCTGC ACATCTCCGA      420
CATCAACGAT AATGCCCCCG T                                             441

```

## (2) INFORMATION FOR SEQ ID NO:91:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 146 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:91:

```

Lys Ala Phe Asp Phe Glu Glu Thr Ser Arg Tyr Val Leu Ser Val Glu
1           5           10           15
Ala Lys Asp Gly Gly Val His Thr Ala His Cys Asn Val Gln Ile Glu
20          25          30
Ile Val Asp Glu Asn Asp Asn Ala Pro Glu Val Thr Phe Met Ser Phe
35          40          45
Ser Asn Gln Ile Pro Glu Asp Ser Asp Leu Gly Thr Val Ile Ala Leu
50          55          60
Ile Lys Val Arg Asp Lys Asp Ser Gly Gln Asn Gly Met Val Thr Cys
65          70          75          80
Tyr Thr Gln Glu Glu Val Pro Phe Lys Leu Glu Ser Thr Ser Lys Asn
85          90          95
Tyr Tyr Lys Leu Val Ile Ala Gly Ala Leu Asn Arg Glu Gln Thr Ala
100         105         110
Asp Tyr Asn Val Thr Ile Ile Ala Thr Asp Lys Gly Lys Pro Ala Leu
115        120        125
Ser Ser Arg Thr Ser Ile Thr Leu His Ile Ser Asp Ile Asn Asp Asn
130        135        140
Ala Pro
145

```

## (2) INFORMATION FOR SEQ ID NO:92:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 131 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:92:

```

AAGCGAGTGG ATTACGAGGC CACTCGGAAT TATAAGCTGA GAGTTAAGGC TACTGATCTT      60
GGGATTCCAC CGAGATCTTC TAACATGACA CTGTTTCATTC ATGTCCTTGA TGTTAACGAC      120
AACGCTCCCT T                                                                131

```

## (2) INFORMATION FOR SEQ ID NO:93:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 43 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:93:

```

Lys Arg Val Asp Tyr Glu Ala Thr Arg Asn Tyr Lys Leu Arg Val Lys
1           5           10           15
Ala Thr Asp Leu Gly Ile Pro Pro Arg Ser Ser Asn Met Thr Leu Phe
          20           25           30
Ile His Val Leu Asp Val Asn Asp Asn Ala Pro
          35           40

```

## (2) INFORMATION FOR SEQ ID NO:94:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 4104 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

## (ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 495..3572

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:94:

CCTCTATTCG ACATTCTCTT TGGATTGTTT TGCTATAACT TGAAATTTGG GATGTCACAA	60
ACGAAACTGT CATCTGTTTC CGCCAAACTG TGGTTCTGCT AATCTCCCAG GCTGGCAGCA	120
TTGGAGACTT GCTGACTTCT TTCATCCCCC ACTCTTTTCA CCTGAAATTC CTTTCCTTGG	180
TTTTGCTCTA AGTCCTATGC TTCAGTCAGG GGCCAACCAA ATCTCACTGC CTCCTTTTTA	240
TCATGAAGCC TTTGATCACT GATAGTTCTT TTTATATCTT GAAAAATCAC CCTTCCCAGT	300
ACAGTTAATA TTTAGTATCT CTA CTCTCATCT TGGCACTTAC TCACAGCTCC ATAATTCAGT	360
CGTTTTTCGTA CCTCTTCATG GTGATGGGGA GCCCTTTTGA GGTGGTGACT GTGCTTTATA	420
CTCCTCATGA TGCTTCACAT GTGGCAGGCG TGGAGTGCCC GGAGGCGGCC CTCCTGATTC	480
TGGGGCCTCC CAGG ATG GAG CCC CTG AGG CAC AGC CCA GGC CCT GGG GGG	530
Met Glu Pro Leu Arg His Ser Pro Gly Pro Gly Gly	
1 5 10	
CAA CGG CTA CTG CTG CCC TCC ATG CTG CTA GCA CTG CTG CTC CTG CTG	578
Gln Arg Leu Leu Leu Pro Ser Met Leu Leu Ala Leu Leu Leu Leu	
15 20 25	
GCT CCA TCC CCA GGC CAC GCC ACT CGG GTA GTG TAC AAG GTG CCG GAG	626
Ala Pro Ser Pro Gly His Ala Thr Arg Val Val Tyr Lys Val Pro Glu	
30 35 40	
GAA CAG CCA CCC AAC ACC CTC ATT GGG AGC CTC GCA GCC GAC TAT GGT	674
Glu Gln Pro Pro Asn Thr Leu Ile Gly Ser Leu Ala Ala Asp Tyr Gly	
45 50 55 60	
TTT CCA GAT GTG GGG CAC CTG TAC AAG CTA GAG GTG GGT GCC CCG TAC	722
Phe Pro Asp Val Gly His Leu Tyr Lys Leu Glu Val Gly Ala Pro Tyr	
65 70 75	
CTT CGC GTG GAT GGC AAG ACA GGT GAC ATT TTC ACC ACC GAG ACC TCC	770
Leu Arg Val Asp Gly Lys Thr Gly Asp Ile Phe Thr Thr Glu Thr Ser	
80 85 90	
ATC GAC CGT GAG GGG CTC CGT GAA TGC CAG AAC CAG CTC CCT GGT GAT	818
Ile Asp Arg Glu Gly Leu Arg Glu Cys Gln Asn Gln Leu Pro Gly Asp	
95 100 105	
CCC TGC ATC CTG GAG TTT GAG GTA TCT ATC ACA GAC CTC GTG CAG AAT	866
Pro Cys Ile Leu Glu Phe Glu Val Ser Ile Thr Asp Leu Val Gln Asn	
110 115 120	
GCG AGC CCC CGG CTG CTA GAG GGC CAG ATA GAA GTA CAA GAC ATC AAT	914
Ala Ser Pro Arg Leu Leu Glu Gly Gln Ile Glu Val Gln Asp Ile Asn	
125 130 135 140	
GAC AAC ACA CCC AAC TTC GCC TCA CCA GTC ATC ACT CTG GCC ATC CCT	962
Asp Asn Thr Pro Asn Phe Ala Ser Pro Val Ile Thr Leu Ala Ile Pro	
145 150 155	
GAG AAC ACC AAC ATC GGC TCA CTC TTC CCC ATC CCG CTG GCT TCA GAC	1010
Glu Asn Thr Asn Ile Gly Ser Leu Phe Pro Ile Pro Leu Ala Ser Asp	
160 165 170	

CGT GAT GCT GGT CCC AAC GGT GTG GCA TCC TAT GAG CTG CAG GTG GCA Arg Asp Ala Gly Pro Asn Gly Val Ala Ser Tyr Glu Leu Gln Val Ala 175 180 185	1058
GAG GAC CAG GAG GAG AAG CAA CCA CAG CTC ATT GTG ATG GGC AAC CTG Glu Asp Gln Glu Glu Lys Gln Pro Gln Leu Ile Val Met Gly Asn Leu 190 195 200	1106
GAC CGT GAG CGC TGG GAC TCC TAT GAC CTC ACC ATC AAG GTG CAG GAT Asp Arg Glu Arg Trp Asp Ser Tyr Asp Leu Thr Ile Lys Val Gln Asp 205 210 215 220	1154
GGC GGC AGC CCC CCA CGC GCC ACG AGT GCC CTG CTG CGT GTC ACC GTG Gly Gly Ser Pro Pro Arg Ala Thr Ser Ala Leu Leu Arg Val Thr Val 225 230 235	1202
CTT GAC ACC AAT GAC AAC GCC CCC AAG TTT GAG CGG CCC TCC TAT GAG Leu Asp Thr Asn Asp Asn Ala Pro Lys Phe Glu Arg Pro Ser Tyr Glu 240 245 250	1250
GCC GAA CTA TCT GAG AAT AGC CCC ATA GGC CAC TCG GTC ATC CAG GTG Ala Glu Leu Ser Glu Asn Ser Pro Ile Gly His Ser Val Ile Gln Val 255 260 265	1298
AAG GCC AAT GAC TCA GAC CAA GGT GCC AAT GCA GAA ATC GAA TAC ACA Lys Ala Asn Asp Ser Asp Gln Gly Ala Asn Ala Glu Ile Glu Tyr Thr 270 275 280	1346
TTC CAC CAG GCG CCC GAA GTT GTG AGG CGT CTT CTT CGA CTG GAC AGG Phe His Gln Ala Pro Glu Val Val Arg Arg Leu Leu Arg Leu Asp Arg 285 290 295 300	1394
AAC ACT GGA CTT ATC ACT GTT CAG GGC CCG GTG GAC CGT GAG GAC CTA Asn Thr Gly Leu Ile Thr Val Gln Gly Pro Val Asp Arg Glu Asp Leu 305 310 315	1442
AGC ACC CTG CGC TTC TCA GTG CTT GCT AAG GAC CGA GGC ACC AAC CCC Ser Thr Leu Arg Phe Ser Val Leu Ala Lys Asp Arg Gly Thr Asn Pro 320 325 330	1490
AAG AGT GCC CGT GCC CAG GTG GTT GTG ACC GTG AAG GAC ATG AAT GAC Lys Ser Ala Arg Ala Gln Val Val Val Thr Val Lys Asp Met Asn Asp 335 340 345	1538
AAT GCC CCC ACC ATT GAG ATC CGG GGC ATA GGG CTA GTG ACT CAT CAA Asn Ala Pro Thr Ile Glu Ile Arg Gly Ile Gly Leu Val Thr His Gln 350 355 360	1586
GAT GGG ATG GCT AAC ATC TCA GAG GAT GTG GCA GAG GAG ACA GCT GTG Asp Gly Met Ala Asn Ile Ser Glu Asp Val Ala Glu Glu Thr Ala Val 365 370 375 380	1634
GCC CTG GTG CAG GTG TCT GAC CGA GAT GAG GGA GAG AAT GCA GCT GTC Ala Leu Val Gln Val Ser Asp Arg Glu Gly Glu Asn Ala Ala Val 385 390 395	1682
ACC TGT GTG GTG GCA GGT GAT GTG CCC TTC CAG CTG CGC CAG GCC AGT Thr Cys Val Val Ala Gly Asp Val Pro Phe Gln Leu Arg Gln Ala Ser 400 405 410	1730

GAG ACA GGC AGT GAC AGC AAG AAG AAG TAT TTC CTG CAG ACT ACC ACC Glu Thr Gly Ser Asp Ser Lys Lys Tyr Phe Leu Gln Thr Thr Thr 415 420 425	1778
CCG CTA GAC TAC GAG AAG GTC AAA GAC TAC ACC ATT GAG ATT GTG GCT Pro Leu Asp Tyr Glu Lys Val Lys Asp Tyr Thr Ile Glu Ile Val Ala 430 435 440	1826
GTG GAC TCT GGC AAC CCC CCA CTC TCC AGC ACT AAC TCC CTC AAG GTG Val Asp Ser Gly Asn Pro Pro Leu Ser Ser Thr Asn Ser Leu Lys Val 445 450 455 460	1874
CAG GTG GTG GAC GTC AAT GAC AAC GCA CCT GTC TTC ACT CAG AGT GTC Gln Val Val Asp Val Asn Asp Asn Ala Pro Val Phe Thr Gln Ser Val 465 470 475	1922
ACT GAG GTC GCC TTC CCG GAA AAC AAC AAG CCT GGT GAA GTG ATT GCT Thr Glu Val Ala Phe Pro Glu Asn Asn Lys Pro Gly Glu Val Ile Ala 480 485 490	1970
GAG ATC ACT GCC AGT GAT GCT GAC TCT GGC TCT AAT GCT GAG CTG GTT Glu Ile Thr Ala Ser Asp Ala Asp Ser Gly Ser Asn Ala Glu Leu Val 495 500 505	2018
TAC TCT CTG GAG CCT GAG CCG GCT GCT AAG GGC CTC TTC ACC ATC TCA Tyr Ser Leu Glu Pro Glu Pro Ala Ala Lys Gly Leu Phe Thr Ile Ser 510 515 520	2066
CCC GAG ACT GGA GAG ATC CAG GTG AAG ACA TCT CTG GAT CGG GAA CAG Pro Glu Thr Gly Glu Ile Gln Val Lys Thr Ser Leu Asp Arg Glu Gln 525 530 535 540	2114
CGG GAG AGC TAT GAG TTG AAG GTG GTG GCA GCT GAC CGG GGC AGT CCT Arg Glu Ser Tyr Glu Leu Lys Val Val Ala Ala Asp Arg Gly Ser Pro 545 550 555	2162
AGC CTC CAG GGC ACA GCC ACT GTC CTT GTC AAT GTG CTG GAC TGC AAT Ser Leu Gln Gly Thr Ala Thr Val Leu Val Asn Val Leu Asp Cys Asn 560 565 570	2210
GAC AAT GAC CCC AAA TTT ATG CTG AGT GGC TAC AAC TTC TCA GTG ATG Asp Asn Asp Pro Lys Phe Met Leu Ser Gly Tyr Asn Phe Ser Val Met 575 580 585	2258
GAG AAC ATG CCA GCA CTG AGT CCA GTG GGC ATG GTG ACT GTC ATT GAT Glu Asn Met Pro Ala Leu Ser Pro Val Gly Met Val Thr Val Ile Asp 590 595 600	2306
GGA GAC AAG GGG GAG AAT GCC CAG GTG CAG CTC TCA GTG GAG CAG GAC Gly Asp Lys Gly Glu Asn Ala Gln Val Gln Leu Ser Val Glu Gln Asp 605 610 615 620	2354
AAC GGT GAC TTT GTT ATC CAG AAT GGC ACA GGC ACC ATC CTA TCC AGC Asn Gly Asp Phe Val Ile Gln Asn Gly Thr Gly Thr Ile Leu Ser Ser 625 630 635	2402
CTG AGC TTT GAT CGA GAG CAA CAA AGC ACC TAC ACC TTC CAG CTG AAG Leu Ser Phe Asp Arg Glu Gln Gln Ser Thr Tyr Thr Phe Gln Leu Lys 640 645 650	2450

GCA GTG GAT GGT GGC GTC CCA CCT CGC TCA GCT TAC GTT GGT GTC ACC Ala Val Asp Gly Gly Val Pro Pro Arg Ser Ala Tyr Val Gly Val Thr 655 660 665	2498
ATC AAT GTG CTG GAC GAG AAT GAC AAC GCA CCC TAT ATC ACT GCC CCT Ile Asn Val Leu Asp Glu Asn Asp Asn Ala Pro Tyr Ile Thr Ala Pro 670 675 680	2546
TCT AAC ACC TCT CAC AAG CTG CTG ACC CCC CAG ACA CGT CTT GGT GAG Ser Asn Thr Ser His Lys Leu Leu Thr Pro Gln Thr Arg Leu Gly Glu 685 690 695 700	2594
ACG GTC AGC CAG GTG GCA GCC GAG GAC TTT GAC TCT GGT GTC AAT GCC Thr Val Ser Gln Val Ala Ala Glu Asp Phe Asp Ser Gly Val Asn Ala 705 710 715	2642
GAG CTG ATC TAC AGC ATT GCA GGT GGC AAC CCT TAT GGA CTC TTC CAG Glu Leu Ile Tyr Ser Ile Ala Gly Gly Asn Pro Tyr Gly Leu Phe Gln 720 725 730	2690
ATT GGG TCA CAT TCA GGT GCC ATC ACC CTG GAG AAG GAG ATT GAG CGG Ile Gly Ser His Ser Gly Ala Ile Thr Leu Glu Lys Glu Ile Glu Arg 735 740 745	2738
CGC CAC CAT GGG CTA CAC CGC CTG GTG GTG AAG GTC AGT GAC CGC GGC Arg His His Gly Leu His Arg Leu Val Val Lys Val Ser Asp Arg Gly 750 755 760	2786
AAG CCC CCA CGC TAT GGC ACA GCC TTG GTC CAT CTT TAT GTC AAT GAG Lys Pro Pro Arg Tyr Gly Thr Ala Leu Val His Leu Tyr Val Asn Glu 765 770 775 780	2834
ACT CTG GCC AAC CGC ACG CTG CTG GAG ACC CTC CTG GGC CAC AGC CTG Thr Leu Ala Asn Arg Thr Leu Leu Glu Thr Leu Leu Gly His Ser Leu 785 790 795	2882
GAC ACG CCG CTG GAT ATT GAC ATT GCT GGG GAT CCA GAA TAT GAG CGC Asp Thr Pro Leu Asp Ile Asp Ile Ala Gly Asp Pro Glu Tyr Glu Arg 800 805 810	2930
TCC AAG CAG CGT GGC AAC ATT CTC TTT GGT GTG GTG GCT GGT GTG GTG Ser Lys Gln Arg Gly Asn Ile Leu Phe Gly Val Val Ala Gly Val Val 815 820 825	2978
GCC GTG GCC TTG CTC ATC GCC CTG GCG GTT CTT GTG CGC TAC TGC AGA Ala Val Ala Leu Leu Ile Ala Leu Ala Val Leu Val Arg Tyr Cys Arg 830 835 840	3026
CAG CGG GAG GCC AAA AGT GGT TAC CAG GCT GGT AAG AAG GAG ACC AAG Gln Arg Glu Ala Lys Ser Gly Tyr Gln Ala Gly Lys Lys Glu Thr Lys 845 850 855 860	3074
GAC CTG TAT GCC CCC AAG CCC AGT GGC AAG GCC TCC AAG GGA AAC AAA Asp Leu Tyr Ala Pro Lys Pro Ser Gly Lys Ala Ser Lys Gly Asn Lys 865 870 875	3122
AGC AAA GGC AAG AAG AGC AAG TCC CCA AAG CCC GTG AAG CCA GTG GAG Ser Lys Gly Lys Lys Ser Lys Ser Pro Lys Pro Val Lys Pro Val Glu 880 885 890	3170



GAC GAG GAT GAG GCC GGG CTG CAG AAG TCC CTC AAG TTC AAC CTG ATG Asp Glu Asp Glu Ala Gly Leu Gln Lys Ser Leu Lys Phe Asn Leu Met 895 900 905	3218
AGC GAT GCC CCT GGG GAC AGT CCC CGC ATC CAC CTG CCC CTC AAC TAC Ser Asp Ala Pro Gly Asp Ser Pro Arg Ile His Leu Pro Leu Asn Tyr 910 915 920	3266
CCA CCA GGC AGC CCT GAC CTG GGC CGC CAC TAT CGC TCT AAC TCC CCA Pro Pro Gly Ser Pro Asp Leu Gly Arg His Tyr Arg Ser Asn Ser Pro 925 930 935 940	3314
CTG CCT TCC ATC CAG CTG CAG CCC CAG TCA CCC TCA GCC TCC AAG AAG Leu Pro Ser Ile Gln Leu Gln Pro Gln Ser Pro Ser Ala Ser Lys Lys 945 950 955	3362
CAC CAG GTG GTA CAG GAC CTG CCA CCT GCA AAC ACA TTC GTG GGC ACC His Gln Val Val Gln Asp Leu Pro Pro Ala Asn Thr Phe Val Gly Thr 960 965 970	3410
GGG GAC ACC ACG TCC ACG GGC TCT GAG CAG TAC TCC GAC TAC AGC TAC Gly Asp Thr Thr Ser Thr Gly Ser Glu Gln Tyr Ser Asp Tyr Ser Tyr 975 980 985	3458
CGC ACC AAC CCC CCC AAA TAC CCC AGC AAG CAG GTA GGC CAG CCC TTT Arg Thr Asn Pro Pro Lys Tyr Pro Ser Lys Gln Val Gly Gln Pro Phe 990 995 1000	3506
CAG CTC AGC ACA CCC CAG CCC CTA CCC CAC CCC TAC CAC GGA GCC ATC Gln Leu Ser Thr Pro Gln Pro Leu Pro His Pro Tyr His Gly Ala Ile 1005 1010 1015 1020	3554
TGG ACC GAG GTG TGG GAG TGATGGAGCA GGTTTACTGT GCCTGCCCCGT Trp Thr Glu Val Trp Glu 1025	3602
GTTGGGGGCC AGCCTGAGCC AGCAGTGGGA GGTGGGGCCT TAGTGCCTCA CCGGGCACAC	3662
GGATTAGGCT GAGTGAAGAT TAAGGGAGGG TGTGCTCTGT GGTCTCCTCC CTGCCCTCTC	3722
CCCACTGGGG AGAGACCTGT GATTTGCCAA GTCCCTGGAC CCTGGACCAG CTA'CTGGGCC	3782
TTATGGGTTG GGGGTGGTAG GCAGGTGAGC GTAAGTGGGG AGGGAAATGG GTAAGAAGTC	3842
TACTCCAAAC CTAGGTCTCT ATGTCAGACC AGACCTAGGT GCTTCTCTAG GAGGGAAACA	3902
GGGAGACCTG GGGTCCTGTG GATAACTGAG TGGGGAGTCT GCCAGGGGAG GGCACCTTCC	3962
CATTGTGCCT TCTGTGTGTA TTGTGCATTA ACCTCTTCCT CACCACTAGG CTTCTGGGGC	4022
TGGGTCCCAC ATGCCCTTGA CCCTGACAAT AAAGTTCTCT ATTTTGTGAA AAAAAAAAAA	4082
AAAAAAAAAA AAAAAAAAAA AA	4104

## (2) INFORMATION FOR SEQ ID NO:95:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1026 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:95:

```

Met Glu Pro Leu Arg His Ser Pro Gly Pro Gly Gly Gln Arg Leu Leu
 1             5             10             15

Leu Pro Ser Met Leu Leu Ala Leu Leu Leu Leu Ala Pro Ser Pro
      20             25             30

Gly His Ala Thr Arg Val Val Tyr Lys Val Pro Glu Glu Gln Pro Pro
      35             40             45

Asn Thr Leu Ile Gly Ser Leu Ala Ala Asp Tyr Gly Phe Pro Asp Val
      50             55             60

Gly His Leu Tyr Lys Leu Glu Val Gly Ala Pro Tyr Leu Arg Val Asp
      65             70             75             80

Gly Lys Thr Gly Asp Ile Phe Thr Thr Glu Thr Ser Ile Asp Arg Glu
      85             90             95

Gly Leu Arg Glu Cys Gln Asn Gln Leu Pro Gly Asp Pro Cys Ile Leu
      100            105            110

Glu Phe Glu Val Ser Ile Thr Asp Leu Val Gln Asn Ala Ser Pro Arg
      115            120            125

Leu Leu Glu Gly Gln Ile Glu Val Gln Asp Ile Asn Asp Asn Thr Pro
      130            135            140

Asn Phe Ala Ser Pro Val Ile Thr Leu Ala Ile Pro Glu Asn Thr Asn
      145            150            155            160

Ile Gly Ser Leu Phe Pro Ile Pro Leu Ala Ser Asp Arg Asp Ala Gly
      165            170            175

Pro Asn Gly Val Ala Ser Tyr Glu Leu Gln Val Ala Glu Asp Gln Glu
      180            185            190

Glu Lys Gln Pro Gln Leu Ile Val Met Gly Asn Leu Asp Arg Glu Arg
      195            200            205

Trp Asp Ser Tyr Asp Leu Thr Ile Lys Val Gln Asp Gly Gly Ser Pro
      210            215            220

Pro Arg Ala Thr Ser Ala Leu Leu Arg Val Thr Val Leu Asp Thr Asn
      225            230            235            240

Asp Asn Ala Pro Lys Phe Glu Arg Pro Ser Tyr Glu Ala Glu Leu Ser
      245            250            255

Glu Asn Ser Pro Ile Gly His Ser Val Ile Gln Val Lys Ala Asn Asp
      260            265            270

```

Ser Asp Gln Gly Ala Asn Ala Glu Ile Glu Tyr Thr Phe His Gln Ala  
 275 280 285  
 Pro Glu Val Val Arg Arg Leu Leu Arg Leu Asp Arg Asn Thr Gly Leu  
 290 295 300  
 Ile Thr Val Gln Gly Pro Val Asp Arg Glu Asp Leu Ser Thr Leu Arg  
 305 310 315 320  
 Phe Ser Val Leu Ala Lys Asp Arg Gly Thr Asn Pro Lys Ser Ala Arg  
 325 330 335  
 Ala Gln Val Val Val Thr Val Lys Asp Met Asn Asp Asn Ala Pro Thr  
 340 345 350  
 Ile Glu Ile Arg Gly Ile Gly Leu Val Thr His Gln Asp Gly Met Ala  
 355 360 365  
 Asn Ile Ser Glu Asp Val Ala Glu Glu Thr Ala Val Ala Leu Val Gln  
 370 375 380  
 Val Ser Asp Arg Asp Glu Gly Glu Asn Ala Ala Val Thr Cys Val Val  
 385 390 395 400  
 Ala Gly Asp Val Pro Phe Gln Leu Arg Gln Ala Ser Glu Thr Gly Ser  
 405 410 415  
 Asp Ser Lys Lys Lys Tyr Phe Leu Gln Thr Thr Thr Pro Leu Asp Tyr  
 420 425 430  
 Glu Lys Val Lys Asp Tyr Thr Ile Glu Ile Val Ala Val Asp Ser Gly  
 435 440 445  
 Asn Pro Pro Leu Ser Ser Thr Asn Ser Leu Lys Val Gln Val Val Asp  
 450 455 460  
 Val Asn Asp Asn Ala Pro Val Phe Thr Gln Ser Val Thr Glu Val Ala  
 465 470 475 480  
 Phe Pro Glu Asn Asn Lys Pro Gly Glu Val Ile Ala Glu Ile Thr Ala  
 485 490 495  
 Ser Asp Ala Asp Ser Gly Ser Asn Ala Glu Leu Val Tyr Ser Leu Glu  
 500 505 510  
 Pro Glu Pro Ala Ala Lys Gly Leu Phe Thr Ile Ser Pro Glu Thr Gly  
 515 520 525  
 Glu Ile Gln Val Lys Thr Ser Leu Asp Arg Glu Gln Arg Glu Ser Tyr  
 530 535 540  
 Glu Leu Lys Val Val Ala Ala Asp Arg Gly Ser Pro Ser Leu Gln Gly  
 545 550 555 560  
 Thr Ala Thr Val Leu Val Asn Val Leu Asp Cys Asn Asp Asn Asp Pro  
 565 570 575  
 Lys Phe Met Leu Ser Gly Tyr Asn Phe Ser Val Met Glu Asn Met Pro  
 580 585 590

Ala Leu Ser Pro Val Gly Met Val Thr Val Ile Asp Gly Asp Lys Gly  
595 600 605

Glu Asn Ala Gln Val Gln Leu Ser Val Glu Gln Asp Asn Gly Asp Phe  
610 615 620

Val Ile Gln Asn Gly Thr Gly Thr Ile Leu Ser Ser Leu Ser Phe Asp  
625 630 635 640

Arg Glu Gln Gln Ser Thr Tyr Thr Phe Gln Leu Lys Ala Val Asp Gly  
645 650 655

Gly Val Pro Pro Arg Ser Ala Tyr Val Gly Val Thr Ile Asn Val Leu  
660 665 670

Asp Glu Asn Asp Asn Ala Pro Tyr Ile Thr Ala Pro Ser Asn Thr Ser  
675 680 685

His Lys Leu Leu Thr Pro Gln Thr Arg Leu Gly Glu Thr Val Ser Gln  
690 695 700

Val Ala Ala Glu Asp Phe Asp Ser Gly Val Asn Ala Glu Leu Ile Tyr  
705 710 715 720

Ser Ile Ala Gly Gly Asn Pro Tyr Gly Leu Phe Gln Ile Gly Ser His  
725 730 735

Ser Gly Ala Ile Thr Leu Glu Lys Glu Ile Glu Arg Arg His His Gly  
740 745 750

Leu His Arg Leu Val Val Lys Val Ser Asp Arg Gly Lys Pro Pro Arg  
755 760 765

Tyr Gly Thr Ala Leu Val His Leu Tyr Val Asn Glu Thr Leu Ala Asn  
770 775 780

Arg Thr Leu Leu Glu Thr Leu Leu Gly His Ser Leu Asp Thr Pro Leu  
785 790 795 800

Asp Ile Asp Ile Ala Gly Asp Pro Glu Tyr Glu Arg Ser Lys Gln Arg  
805 810 815

Gly Asn Ile Leu Phe Gly Val Val Ala Gly Val Val Ala Val Ala Leu  
820 825 830

Leu Ile Ala Leu Ala Val Leu Val Arg Tyr Cys Arg Gln Arg Glu Ala  
835 840 845

Lys Ser Gly Tyr Gln Ala Gly Lys Lys Glu Thr Lys Asp Leu Tyr Ala  
850 855 860

Pro Lys Pro Ser Gly Lys Ala Ser Lys Gly Asn Lys Ser Lys Gly Lys  
865 870 875 880

Lys Ser Lys Ser Pro Lys Pro Val Lys Pro Val Glu Asp Glu Asp Glu  
885 890 895

Ala Gly Leu Gln Lys Ser Leu Lys Phe Asn Leu Met Ser Asp Ala Pro  
900 905 910

Gly Asp Ser Pro Arg Ile His Leu Pro Leu Asn Tyr Pro Pro Gly Ser  
 915 920 925

Pro Asp Leu Gly Arg His Tyr Arg Ser Asn Ser Pro Leu Pro Ser Ile  
 930 935 940

Gln Leu Gln Pro Gln Ser Pro Ser Ala Ser Lys Lys His Gln Val Val  
 945 950 955 960

Gln Asp Leu Pro Pro Ala Asn Thr Phe Val Gly Thr Gly Asp Thr Thr  
 965 970 975

Ser Thr Gly Ser Glu Gln Tyr Ser Asp Tyr Ser Tyr Arg Thr Asn Pro  
 980 985 990

Pro Lys Tyr Pro Ser Lys Gln Val Gly Gln Pro Phe Gln Leu Ser Thr  
 995 1000 1005

Pro Gln Pro Leu Pro His Pro Tyr His Gly Ala Ile Trp Thr Glu Val  
 1010 1015 1020

Trp Glu  
 1025

## (2) INFORMATION FOR SEQ ID NO:96:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 4705 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

- (ix) FEATURE:
- (A) NAME/KEY: CDS
  - (B) LOCATION: 115..2827

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:96:

CGAAAGCCAT GTCGGACTCG TCGCCCAGCG CCCAAGCGCT AACCCGCTGA AAGTTTCTCA 60

GCGAAATCTC AGGGACGATC TGGACCCCGC TGAGAGGAAC TGCTTTTGAG TGAG ATG 117  
 Met  
 1

GTC CCA GAG GCC TGG AGG AGC GGA CTG GTA AGC ACC GGG AGG GTA GTG 165  
 Val Pro Glu Ala Trp Arg Ser Gly Leu Val Ser Thr Gly Arg Val Val  
 5 10 15

GGA GTT TTG CTT CTG CTT GGT GCC TTG AAC AAG GCT TCC ACG GTC ATT 213  
 Gly Val Leu Leu Leu Gly Ala Leu Asn Lys Ala Ser Thr Val Ile  
 20 25 30

CAC TAT GAG ATC CCG GAG GAA AGA GAG AAG GGT TTC GCT GTG GGC AAC 261  
 His Tyr Glu Ile Pro Glu Glu Arg Glu Lys Gly Phe Ala Val Gly Asn  
 35 40 45

GTG GTC GCG AAC CTT GGT TTG GAT CTC GGT AGC CTC TCA GCC CGC AGG Val Val Ala Asn Leu Gly Leu Asp Leu Gly Ser Leu Ser Ala Arg Arg 50 55 60 65	309
TTC CCG GTG GTG TCT GGA GCT AGC CGA AGA TTC TTT GAG GTG AAC CGG Phe Pro Val Val Ser Gly Ala Ser Arg Arg Phe Phe Glu Val Asn Arg 70 75 80	357
GAG ACC GGA GAG ATG TTT GTG AAC GAC CGT CTG GAT CGA GAG GAG CTG Glu Thr Gly Glu Met Phe Val Asn Asp Arg Leu Asp Arg Glu Glu Leu 85 90 95	405
TGT GGG ACA CTG CCC TCT TGC ACT GTA ACT CTG GAG TTG GTA GTG GAG Cys Gly Thr Leu Pro Ser Cys Thr Val Thr Leu Glu Leu Val Val Glu 100 105 110	453
AAC CCG CTG GAG CTG TTC AGC GTG GAA GTG GTG ATC CAG GAC ATC AAC Asn Pro Leu Glu Leu Phe Ser Val Glu Val Val Ile Gln Asp Ile Asn 115 120 125	501
GAC AAC AAT CCT GCT TTC CCT ACC CAG GAA ATG AAA TTG GAG ATT AGC Asp Asn Asn Pro Ala Phe Pro Thr Gln Glu Met Lys Leu Glu Ile Ser 130 135 140 145	549
GAG GCC GTG GCT CCG GGG ACG CGC TTT CCG CTC GAG AGC GCG CAC GAT Glu Ala Val Ala Pro Gly Thr Arg Phe Pro Leu Glu Ser Ala His Asp 150 155 160	597
CCC GAT CTG GGA AGC AAC TCT TTA CAA ACC TAT GAG CTG AGC CGA AAT Pro Asp Leu Gly Ser Asn Ser Leu Gln Thr Tyr Glu Leu Ser Arg Asn 165 170 175	645
GAA TAC TTT GCG CTT CGC GTG CAG ACG CGG GAG GAC AGC ACC AAG TAC Glu Tyr Phe Ala Leu Arg Val Gln Thr Arg Glu Asp Ser Thr Lys Tyr 180 185 190	693
GCG GAG CTG GTG TTG GAG CGC GCC CTG GAC CGA GAA CGG GAG CCT AGT Ala Glu Leu Val Leu Glu Arg Ala Leu Asp Arg Glu Arg Glu Pro Ser 195 200 205	741
CTC CAG TTA GTG CTG ACG GCG TTG GAC GGA GGG ACC CCA GCT CTC TCC Leu Gln Leu Val Leu Thr Ala Leu Asp Gly Gly Thr Pro Ala Leu Ser 210 215 220 225	789
GCC AGC CTG CCT ATT CAC ATC AAG GTG CTG GAC GCG AAT GAC AAT GCG Ala Ser Leu Pro Ile His Ile Lys Val Leu Asp Ala Asn Asp Asn Ala 230 235 240	837
CCT GTC TTC AAC CAG TCC TTG TAC CGG GCG CGC GTT CCT GGA GGA TGC Pro Val Phe Asn Gln Ser Leu Tyr Arg Ala Arg Val Pro Gly Gly Cys 245 250 255	885
ACC TCC GGC ACG CGC GTG GTA CAA GTC CTT GCA ACG GAT CTG GAT GAA Thr Ser Gly Thr Arg Val Val Gln Val Leu Ala Thr Asp Leu Asp Glu 260 265 270	933
GGC CCC AAC GGT GAA ATT ATT TAC TCC TTC GGC AGC CAC AAC CGC GCC Gly Pro Asn Gly Glu Ile Ile Tyr Ser Phe Gly Ser His Asn Arg Ala 275 280 285	981

GGC GTG CGG CAA CTA TTC GCC TTA GAC CTT GTA ACC GGG ATG CTG ACA Gly Val Arg Gln Leu Phe Ala Leu Asp Leu Val Thr Gly Met Leu Thr 290 295 300 305	1029
ATC AAG GGT CGG CTG GAC TTC GAG GAC ACC AAA CTC CAT GAG ATT TAC Ile Lys Gly Arg Leu Asp Phe Glu Asp Thr Lys Leu His Glu Ile Tyr 310 315 320	1077
ATC CAG GCC AAA GAC AAG GGC GCC AAT CCC GAA GGA GCA CAT TGC AAA Ile Gln Ala Lys Asp Lys Gly Ala Asn Pro Glu Gly Ala His Cys Lys 325 330 335	1125
GTG TTG GTG GAG GTT GTG GAT GTG AAT GAC AAC GCC CCG GAG ATC ACA Val Leu Val Glu Val Val Asp Val Asn Asp Asn Ala Pro Glu Ile Thr 340 345 350	1173
GTC ACC TCC GTG TAC AGC CCA GTA CCC GAG GAT GCC TCT GGG ACT GTC Val Thr Ser Val Tyr Ser Pro Val Pro Glu Asp Ala Ser Gly Thr Val 355 360 365	1221
ATC GCT TTG CTC AGT GTG ACT GAC CTG GAT GCT GGC GAG AAC GGG CTG Ile Ala Leu Leu Ser Val Thr Asp Leu Asp Ala Gly Glu Asn Gly Leu 370 375 380 385	1269
GTG ACC TGC GAA GTT CCA CCG GGT CTC CCT TTC AGC CTT ACT TCT TCC Val Thr Cys Glu Val Pro Pro Gly Leu Pro Phe Ser Leu Thr Ser Ser 390 395 400	1317
CTC AAG AAT TAC TTC ACT TTG AAA ACC AGT GCA GAC CTG GAT CGG GAG Leu Lys Asn Tyr Phe Thr Leu Lys Thr Ser Ala Asp Leu Asp Arg Glu 405 410 415	1365
ACT GTG CCA GAA TAC AAC CTC AGC ATC ACC GCC CGA GAC GCC GGA ACC Thr Val Pro Glu Tyr Asn Leu Ser Ile Thr Ala Arg Asp Ala Gly Thr 420 425 430	1413
CCT TCC CTC TCA GCC CTT ACA ATA GTG CGT GTT CAA GTG TCC GAC ATC Pro Ser Leu Ser Ala Leu Thr Ile Val Arg Val Gln Val Ser Asp Ile 435 440 445	1461
AAT GAC AAC CCT CCA CAA TCT TCT CAA TCT TCC TAC GAC GTT TAC ATT Asn Asp Asn Pro Pro Gln Ser Ser Gln Ser Ser Tyr Asp Val Tyr Ile 450 455 460 465	1509
GAA GAA AAC AAC CTC CCC GGG GCT CCA ATA CTA AAC CTA AGT GTC TGG Glu Glu Asn Asn Leu Pro Gly Ala Pro Ile Leu Asn Leu Ser Val Trp 470 475 480	1557
GAC CCC GAC GCC CCG CAG AAT GCT CGG CTT TCT TTC TTT CTC TTG GAG Asp Pro Asp Ala Pro Gln Asn Ala Arg Leu Ser Phe Phe Leu Leu Glu 485 490 495	1605
CAA GGA GCT GAA ACC GGG CTA GTG GGT CGC TAT TTC ACA ATA AAT CGT Gln Gly Ala Glu Thr Gly Leu Val Gly Arg Tyr Phe Thr Ile Asn Arg 500 505 510	1653
GAC AAT GGC ATA GTG TCA TCC TTA GTG CCC CTA GAC TAT GAG GAT CGG Asp Asn Gly Ile Val Ser Ser Leu Val Pro Leu Asp Tyr Glu Asp Arg 515 520 525	1701

CGG GAA TTT GAA TTA ACA GCT CAT ATC AGC GAT GGG GGC ACC CCG GTC Arg Glu Phe Glu Leu Thr Ala His Ile Ser Asp Gly Gly Thr Pro Val 530 535 540 545	1749
CTA GCC ACC AAC ATC AGC GTG AAC ATA TTT GTC ACT GAT CGC AAT GAC Leu Ala Thr Asn Ile Ser Val Asn Ile Phe Val Thr Asp Arg Asn Asp 550 555 560	1797
AAT GCC CCC CAG GTC CTA TAT CCT CGG CCA GGT GGG AGC TCG GTG GAG Asn Ala Pro Gln Val Leu Tyr Pro Arg Pro Gly Gly Ser Ser Val Glu 565 570 575	1845
ATG CTG CCT CGA GGT ACC TCA GCT GGC CAC CTA GTG TCA CCG GTG GTA Met Leu Pro Arg Gly Thr Ser Ala Gly His Leu Val Ser Arg Val Val 580 585 590	1893
GGC TGG GAC GCG GAT GCA GGG CAC AAT GCC TGG CTC TCC TAC AGT CTC Gly Trp Asp Ala Asp Ala Gly His Asn Ala Trp Leu Ser Tyr Ser Leu 595 600 605	1941
TTT GGA TCC CCT AAC CAG AGC CTT TTT GCC ATA GGG CTG CAC ACT GGT Phe Gly Ser Pro Asn Gln Ser Leu Phe Ala Ile Gly Leu His Thr Gly 610 615 620 625	1989
CAA ATC AGT ACT GCC CGT CCA GTC CAA GAC ACA GAT TCA CCC AGG CAG Gln Ile Ser Thr Ala Arg Pro Val Gln Asp Thr Asp Ser Pro Arg Gln 630 635 640	2037
ACT CTC ACT GTC TTG ATC AAA GAC AAT GGG GAG CCT TCG CTC TCC ACC Thr Leu Thr Val Leu Ile Lys Asp Asn Gly Glu Pro Ser Leu Ser Thr 645 650 655	2085
ACT GCT ACC CTC ACT GTG TCA GTA ACC GAG GAC TCT CCT GAA GCC CGA Thr Ala Thr Leu Thr Val Ser Val Thr Glu Asp Ser Pro Glu Ala Arg 660 665 670	2133
GCC GAG TTC CCC TCT GGC TCT GCC CCC CGG GAG CAG AAA AAA AAT CTC Ala Glu Phe Pro Ser Gly Ser Ala Pro Arg Glu Gln Lys Lys Asn Leu 675 680 685	2181
ACC TTT TAT CTA CTT CTT TCT CTA ATC CTG GTT TCT GTG GGC TTC GTG Thr Phe Tyr Leu Leu Leu Ser Leu Ile Leu Val Ser Val Gly Phe Val 690 695 700 705	2229
GTC ACA GTG TTC GGA GTA ATC ATA TTC AAA GTT TAC AAG TGG AAG CAG Val Thr Val Phe Gly Val Ile Ile Phe Lys Val Tyr Lys Trp Lys Gln 710 715 720	2277
TCT AGA GAC CTA TAC CGA GCC CCG GTG AGC TCA CTG TAC CGA ACA CCA Ser Arg Asp Leu Tyr Arg Ala Pro Val Ser Ser Leu Tyr Arg Thr Pro 725 730 735	2325
GGG CCC TCC TTG CAC GCG GAC GCC GTG CGG GGA GGC CTG ATG TCG CCG Gly Pro Ser Leu His Ala Asp Ala Val Arg Gly Gly Leu Met Ser Pro 740 745 750	2373
CAC CTT TAC CAT CAG GTG TAT CTC ACC ACG GAC TCC CGC CGC AGC GAC His Leu Tyr His Gln Val Tyr Leu Thr Thr Asp Ser Arg Arg Ser Asp 755 760 765	2421



CCG CTG CTG AAG AAA CCT GGT GCA GCC AGT CCA CTG GCC AGC CGC CAG Pro Leu Leu Lys Lys Pro Gly Ala Ala Ser Pro Leu Ala Ser Arg Gln 770 775 780 785	2469
AAC ACG CTG CGG AGC TGT GAT CCG GTG TTC TAT AGG CAG GTG TTG GGT Asn Thr Leu Arg Ser Cys Asp Pro Val Phe Tyr Arg Gln Val Leu Gly 790 795 800	2517
GCA GAG AGC GCC CCT CCC GGA CAG CAA GCC CCG CCC AAC ACG GAC TGG Ala Glu Ser Ala Pro Pro Gly Gln Ala Pro Pro Asn Thr Asp Trp 805 810 815	2565
CGT TTC TCT CAG GCC CAG AGA CCC GGC ACC AGC GGC TCC CAA AAT GGC Arg Phe Ser Gln Ala Gln Arg Pro Gly Thr Ser Gly Ser Gln Asn Gly 820 825 830	2613
GAT GAC ACC GGC ACC TGG CCC AAC AAC CAG TTT GAC ACA GAG ATG CTG Asp Asp Thr Gly Thr Trp Pro Asn Asn Gln Phe Asp Thr Glu Met Leu 835 840 845	2661
CAA GCC ATG ATC TTG GCG TCC GCC AGT GAA GCT GCT GAT GGG AGC TCC Gln Ala Met Ile Leu Ala Ser Ala Ser Glu Ala Ala Asp Gly Ser Ser 850 855 860 865	2709
ACC CTG GGA GGG GGT GCC GGC ACC ATG GGA TTG AGC GCC CGC TAC GGA Thr Leu Gly Gly Gly Ala Gly Thr Met Gly Leu Ser Ala Arg Tyr Gly 870 875 880	2757
CCC CAG TTC ACC CTG CAG CAC GTG CCC GAC TAC CGC CAG AAT GTC TAC Pro Gln Phe Thr Leu Gln His Val Pro Asp Tyr Arg Gln Asn Val Tyr 885 890 895	2805
ATC CCA GGC AGC AAT GCA CAC T GACCAACGCA GCTGGCAAGC GGATGGCAAG Ile Pro Gly Ser Asn Ala His 900	2857
GCCCAGCAGG TGGCAATGGC AACAAGAAGA AGTCGGCAAG AAGGAGAAGA AGTAACATGG	2917
AGGCCAGGCC AAGAGCCACA GGGCAGCCTC TCCCCGAACC AGCCCAGCTT CTCCTTACCT	2977
GCACCCAGGC CTCAGAGTTT CAGGGCTAAC CCCCAGAATA CTGGTAGGGG CCAAGGCATC	3037
TCCCTTGGA ACAGAAACAA GTGCCATCAC ACCATCCCTT CCCCAGGTGT AATATCCAAA	3097
GCAGTTCCGC TGGGAACCCC ATCCAATCAG TGGCTGTACC CATTTGGGTA GTGGGGTTCA	3157
TGTAGACACC AAGAACCATT TGCCACACCC CGTTTAGTTA CAGCTGAACC CTCCATCTTC	3217
CAAATCAATC AGGCCCATCC ATCCCATGCC TCCCTCCTCC CCACCCCACT CCAACAGTTC	3277
CTCTTTCCCG AGTAAGGTGG TTGGGGTGTT GAAGTACCAA GTAACCTACA AGCCTCCTAG	3337
TTCTGAAAAG TTGGAAGGGC ATCATGACCT CTTGGCCTCT CTTTGATTTC TCAATCTTCC	3397
CCCAAAGCAT GGTTTGGTGC CAGCCCCTTC ACCTCCTTCC AGAGCCCCAAG ATCAATGCTC	3457
AAGTTTTGGA GGACATGATC ACCATCCCCA TGGTACTGAT GCTTGCTGGA TTTAGGGAGG	3517
GCATTTTGCT ACCAAGCCTC TTCCCAACGC CCTGGGACCA GTCTTCTGTT TTGTTTTTCA	3577
TTGTTTGAGC TTTCCACTGC ATGCCTTGAC TTCCCCCACC TCCTCCTCAA ACAAGAGACT	3637

CCACTGCATG TTCCAAGACA GTATGGGGTG GTAAGATAAG GAAGGGAAGT GTGTGGATGT 3697  
 GGATGGTGGG GGCATGGACA AAGCTTGACA CATCAAGTTA TCAAGGCCTT GGAGGAGGCT 3757  
 CTGTATGTCC TCAGGGGACT GACAACATCC TCCAGATTCC AGCCATAAAC CAATAACTAG 3817  
 GCTGGACCCT TCCCCTACTA TAATAGGGCT CAGCCAGGCA GCCAGCTTTG GGCTGAGCTA 3877  
 ACAGGACCAA TGGATTAAGT GGCATTTTCAG TCCAAGGAAG CTCGAAGCAG GTTTAGGACC 3937  
 AGGTCCCCCTT GAGAGGTCAG AGGGGCCTCT GTGGGTGCTG GGTACTCCAG AGGTGCCACT 3997  
 GGTGGAAGGG TCAGCGGAGC CCCAGCAGGA AGGGTGGGCC AGCCAGGCCA TTCTTAGTCC 4057  
 CTGGGTGGG GAGGCAGGGA GCTAGGGCAG GGACCAAATG AACAGAAAGT CTCAGCCCAG 4117  
 GATGGGGCTT CTTCAACAGG CCCCTGCCCT CCTGAAGCCT CAGTCCTTCA CCTTGCCAGG 4177  
 TGCCGTTTCT CTTCCGTGAA GGCCACTGCC CAGGTCCCCA GTGCGCCCCC TAGTGCCCAT 4237  
 AGCCTGGTTA AAGTTCCCCA GTGCCTCCTT GTGATAGACC TTCTTCTCCC ACCCCCTTCT 4297  
 GCCCCTGGGT CCCCAGGCCAT CCAGCGGGGC TGCCAGAGAA CCCCAGACCT GCCCTTACAG 4357  
 TAGTGTAGCG CCCCCTCCCT CTTTCGGCTG GTGTAGAATA GCCAGTAGTG TAGTGCGGTG 4417  
 TGCTTTTACG TGATGGCGGG TGGGCAGCGG GCGGCGGCGT CCGCGCAGCC GTCTGTCCTT 4477  
 GATCTGCCCCG CGGCGGCCCCG TGTGTGTTT TGTGCTGTGT CCAGCGCTAA GGCGACCCCC 4537  
 TCCCCCGTAC TGAATTCTCC TATAAGCGCT TCTCTTCGCA TAGTCACGTA GCTCCCACCC 4597  
 CACCTCTTC CTGTGTCTCA CGCAAGTTTT ATACTCTAAT ATTTATATGG CTTTTTTTCT 4657  
 TCGACAAAAA AATAATAAAA CGTTTCTTCT GAAAAA AAAA 4705

(2) INFORMATION FOR SEQ ID NO:97:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 904 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:97:

Met Val Pro Glu Ala Trp Arg Ser Gly Leu Val Ser Thr Gly Arg Val  
 1 5 10 15  
 Val Gly Val Leu Leu Leu Gly Ala Leu Asn Lys Ala Ser Thr Val  
 20 25 30  
 Ile His Tyr Glu Ile Pro Glu Glu Arg Glu Lys Gly Phe Ala Val Gly  
 35 40 45  
 Asn Val Val Ala Asn Leu Gly Leu Asp Leu Gly Ser Leu Ser Ala Arg  
 50 55 60

Arg Phe Pro Val Val Ser Gly Ala Ser Arg Arg Phe Phe Glu Val Asn  
 65 70 75 80  
 Arg Glu Thr Gly Glu Met Phe Val Asn Asp Arg Leu Asp Arg Glu Glu  
 85 90 95  
 Leu Cys Gly Thr Leu Pro Ser Cys Thr Val Thr Leu Glu Leu Val Val  
 100 105 110  
 Glu Asn Pro Leu Glu Leu Phe Ser Val Glu Val Val Ile Gln Asp Ile  
 115 120 125  
 Asn Asp Asn Asn Pro Ala Phe Pro Thr Gln Glu Met Lys Leu Glu Ile  
 130 135 140  
 Ser Glu Ala Val Ala Pro Gly Thr Arg Phe Pro Leu Glu Ser Ala His  
 145 150 155 160  
 Asp Pro Asp Leu Gly Ser Asn Ser Leu Gln Thr Tyr Glu Leu Ser Arg  
 165 170 175  
 Asn Glu Tyr Phe Ala Leu Arg Val Gln Thr Arg Glu Asp Ser Thr Lys  
 180 185 190  
 Tyr Ala Glu Leu Val Leu Glu Arg Ala Leu Asp Arg Glu Arg Glu Pro.  
 195 200 205  
 Ser Leu Gln Leu Val Leu Thr Ala Leu Asp Gly Gly Thr Pro Ala Leu  
 210 215 220  
 Ser Ala Ser Leu Pro Ile His Ile Lys Val Leu Asp Ala Asn Asp Asn  
 225 230 235 240  
 Ala Pro Val Phe Asn Gln Ser Leu Tyr Arg Ala Arg Val Pro Gly Gly  
 245 250 255  
 Cys Thr Ser Gly Thr Arg Val Val Gln Val Leu Ala Thr Asp Leu Asp  
 260 265 270  
 Glu Gly Pro Asn Gly Glu Ile Ile Tyr Ser Phe Gly Ser His Asn Arg  
 275 280 285  
 Ala Gly Val Arg Gln Leu Phe Ala Leu Asp Leu Val Thr Gly Met Leu  
 290 295 300  
 Thr Ile Lys Gly Arg Leu Asp Phe Glu Asp Thr Lys Leu His Glu Ile  
 305 310 315 320  
 Tyr Ile Gln Ala Lys Asp Lys Gly Ala Asn Pro Glu Gly Ala His Cys  
 325 330 335  
 Lys Val Leu Val Glu Val Val Asp Val Asn Asp Asn Ala Pro Glu Ile  
 340 345 350  
 Thr Val Thr Ser Val Tyr Ser Pro Val Pro Glu Asp Ala Ser Gly Thr  
 355 360 365  
 Val Ile Ala Leu Leu Ser Val Thr Asp Leu Asp Ala Gly Glu Asn Gly  
 370 375 380

Leu Val Thr Cys Glu Val Pro Pro Gly Leu Pro Phe Ser Leu Thr Ser  
 385 390 395 400  
 Ser Leu Lys Asn Tyr Phe Thr Leu Lys Thr Ser Ala Asp Leu Asp Arg  
 405 410 415  
 Glu Thr Val Pro Glu Tyr Asn Leu Ser Ile Thr Ala Arg Asp Ala Gly  
 420 425 430  
 Thr Pro Ser Leu Ser Ala Leu Thr Ile Val Arg Val Gln Val Ser Asp  
 435 440 445  
 Ile Asn Asp Asn Pro Pro Gln Ser Ser Gln Ser Ser Tyr Asp Val Tyr  
 450 455 460  
 Ile Glu Glu Asn Asn Leu Pro Gly Ala Pro Ile Leu Asn Leu Ser Val  
 465 470 475 480  
 Trp Asp Pro Asp Ala Pro Gln Asn Ala Arg Leu Ser Phe Phe Leu Leu  
 485 490 495  
 Glu Gln Gly Ala Glu Thr Gly Leu Val Gly Arg Tyr Phe Thr Ile Asn  
 500 505 510  
 Arg Asp Asn Gly Ile Val Ser Ser Leu Val Pro Leu Asp Tyr Glu Asp  
 515 520 525  
 Arg Arg Glu Phe Glu Leu Thr Ala His Ile Ser Asp Gly Gly Thr Pro  
 530 535 540  
 Val Leu Ala Thr Asn Ile Ser Val Asn Ile Phe Val Thr Asp Arg Asn  
 545 550 555 560  
 Asp Asn Ala Pro Gln Val Leu Tyr Pro Arg Pro Gly Gly Ser Ser Val  
 565 570 575  
 Glu Met Leu Pro Arg Gly Thr Ser Ala Gly His Leu Val Ser Arg Val  
 580 585 590  
 Val Gly Trp Asp Ala Asp Ala Gly His Asn Ala Trp Leu Ser Tyr Ser  
 595 600 605  
 Leu Phe Gly Ser Pro Asn Gln Ser Leu Phe Ala Ile Gly Leu His Thr  
 610 615 620  
 Gly Gln Ile Ser Thr Ala Arg Pro Val Gln Asp Thr Asp Ser Pro Arg  
 625 630 635 640  
 Gln Thr Leu Thr Val Leu Ile Lys Asp Asn Gly Glu Pro Ser Leu Ser  
 645 650 655  
 Thr Thr Ala Thr Leu Thr Val Ser Val Thr Glu Asp Ser Pro Glu Ala  
 660 665 670  
 Arg Ala Glu Phe Pro Ser Gly Ser Ala Pro Arg Glu Gln Lys Lys Asn  
 675 680 685  
 Leu Thr Phe Tyr Leu Leu Leu Ser Leu Ile Leu Val Ser Val Gly Phe  
 690 695 700

Val Val Thr Val Phe Gly Val Ile Ile Phe Lys Val Tyr Lys Trp Lys  
 705 710 715 720  
 Gln Ser Arg Asp Leu Tyr Arg Ala Pro Val Ser Ser Leu Tyr Arg Thr  
 725 730 735  
 Pro Gly Pro Ser Leu His Ala Asp Ala Val Arg Gly Gly Leu Met Ser  
 740 745 750  
 Pro His Leu Tyr His Gln Val Tyr Leu Thr Thr Asp Ser Arg Arg Ser  
 755 760 765  
 Asp Pro Leu Leu Lys Lys Pro Gly Ala Ala Ser Pro Leu Ala Ser Arg  
 770 775 780  
 Gln Asn Thr Leu Arg Ser Cys Asp Pro Val Phe Tyr Arg Gln Val Leu  
 785 790 795 800  
 Gly Ala Glu Ser Ala Pro Pro Gly Gln Gln Ala Pro Pro Asn Thr Asp  
 805 810 815  
 Trp Arg Phe Ser Gln Ala Gln Arg Pro Gly Thr Ser Gly Ser Gln Asn  
 820 825 830  
 Gly Asp Asp Thr Gly Thr Trp Pro Asn Asn Gln Phe Asp Thr Glu Met  
 835 840 845  
 Leu Gln Ala Met Ile Leu Ala Ser Ala Ser Glu Ala Ala Asp Gly Ser  
 850 855 860  
 Ser Thr Leu Gly Gly Gly Ala Gly Thr Met Gly Leu Ser Ala Arg Tyr  
 865 870 875 880  
 Gly Pro Gln Phe Thr Leu Gln His Val Pro Asp Tyr Arg Gln Asn Val  
 885 890 895  
 Tyr Ile Pro Gly Ser Asn Ala His  
 900

(2) INFORMATION FOR SEQ ID NO:98:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 556 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:98:

Asp Trp Val Ile Pro Pro Ile Asn Leu Pro Glu Asn Ser Arg Gly Pro  
 1 5 10 15  
 Phe Pro Gln Glu Leu Val Arg Ile Arg Ser Asp Arg Asp Lys Asn Leu  
 20 25 30

Ser Leu Arg Tyr Thr Val Thr Gly Pro Gly Ala Asp Gln Pro Pro Thr  
 35 40 45  
 Gly Ile Phe Ile Ile Asn Pro Ile Ser Gly Gln Leu Ser Val Thr Lys  
 50 55 60  
 Pro Leu Asp Arg Glu Gln Ile Ala Arg Phe His Leu Arg Ala His Ala  
 65 70 75 80  
 Val Asp Ile Asn Gly Asn Gln Val Glu Asn Pro Ile Asp Ile Val Ile  
 85 90 95  
 Asn Val Ile Asp Met Asn Asp Asn Arg Pro Glu Phe Leu His Gln Val  
 100 105 110  
 Trp Asn Gly Ser Val Pro Glu Gly Ser Lys Pro Gly Thr Tyr Val Met  
 115 120 125  
 Thr Val Thr Ala Ile Asp Ala Asp Asp Pro Asn Ala Leu Asn Gly Met  
 130 135 140  
 Leu Arg Tyr Arg Ile Leu Ser Gln Ala Pro Ser Thr Pro Ser Pro Asn  
 145 150 155 160  
 Met Phe Thr Ile Asn Asn Glu Thr Gly Asp Ile Ile Thr Val Ala Ala  
 165 170 175  
 Gly Leu Asp Arg Glu Lys Val Gln Gln Tyr Thr Leu Ile Ile Gln Ala  
 180 185 190  
 Thr Asp Met Glu Gly Asn Pro Thr Tyr Gly Leu Ser Asn Thr Ala Thr  
 195 200 205  
 Ala Val Ile Thr Val Thr Asp Val Asn Asp Asn Pro Pro Glu Phe Thr  
 210 215 220  
 Ala Met Thr Phe Tyr Gly Glu Val Pro Glu Asn Arg Val Asp Ile Ile  
 225 230 235 240  
 Val Ala Asn Leu Thr Val Thr Asp Lys Asp Gln Pro His Thr Pro Ala  
 245 250 255  
 Trp Asn Ala Val Tyr Arg Ile Ser Gly Gly Asp Pro Thr Gly Arg Phe  
 260 265 270  
 Ala Ile Gln Thr Asp Pro Asn Ser Asn Asp Gly Leu Val Thr Val Val  
 275 280 285  
 Lys Pro Ile Asp Phe Glu Thr Asn Arg Met Phe Val Leu Thr Val Ala  
 290 295 300  
 Ala Glu Asn Gln Val Pro Leu Ala Lys Gly Ile Gln His Pro Pro Gln  
 305 310 315 320  
 Ser Thr Ala Thr Val Ser Val Thr Val Ile Asp Val Asn Glu Asn Pro  
 325 330 335  
 Tyr Phe Ala Pro Asn Pro Lys Ile Ile Arg Gln Glu Glu Gly Leu His  
 340 345 350

Ala Gly Thr Met Leu Thr Thr Phe Thr Ala Gly Asp Pro Asp Arg Tyr  
 355 360 365

Met Gln Gln Asn Ile Arg Tyr Thr Lys Leu Ser Asp Pro Ala Asn Trp  
 370 375 380

Leu Lys Ile Asp Pro Val Asn Gly Gln Ile Thr Thr Ile Ala Val Leu  
 385 390 395 400

Asp Arg Glu Ser Pro Asn Val Lys Asn Asn Ile Tyr Asn Ala Thr Phe  
 405 410 415

Leu Ala Ser Asp Asn Gly Ile Pro Pro Met Ser Gly Thr Gly Thr Leu  
 420 425 430

Gln Ile Tyr Leu Leu Asp Ile Asn Asp Asn Ala Pro Gln Val Leu Pro  
 435 440 445

Gln Glu Ala Glu Thr Cys Glu Thr Pro Asp Pro Asn Ser Ile Asn Ile  
 450 455 460

Thr Thr Ala Leu Asp Tyr Asp Ile Asp Pro Asn Ala Gly Pro Phe Ala  
 465 470 475 480

Phe Asp Leu Pro Leu Ser Pro Val Thr Ile Lys Arg Asn Trp Thr Ile  
 485 490 495

Thr Arg Leu Asn Gly Asp Phe Ala Gln Leu Asn Leu Lys Ile Lys Phe  
 500 505 510

Leu Glu Ala Gly Ile Tyr Glu Val Pro Ile Ile Ile Thr Asp Ser Gly  
 515 520 525

Asn Pro Pro Lys Ser Asn Lys Ser Ile Leu Arg Val Arg Val Cys Gln  
 530 535 540

Cys Asp Phe Asn Gly Asp Cys Thr Asp Val Asp Arg  
 545 550 555

## (2) INFORMATION FOR SEQ ID NO:99:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 105 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:99:

Glu Asp Thr Val Tyr Ser Phe Asp Ile Pro Glu Asn Ala Gln Arg Gly  
 1 5 10 15

Tyr Gln Val Gly Gln Ile Val Ala Arg Asp Ala Asp Leu Gly Gln Asn  
 20 25 30

Ala Gln Leu Ser Tyr Gly Val Val Ser Asp Trp Ala Asn Asp Val Phe  
 35 40 45

Ser Leu Asn Pro Gln Thr Gly Met Leu Thr Leu Thr Ala Arg Leu Asp  
 50 55 60

Tyr Glu Glu Val Gln His Tyr Ile Leu Ile Val Gln Ala Gln Asp Asn  
 65 70 75 80

Gly Gln Pro Ser Leu Ser Thr Thr Ile Thr Val Tyr Cys Asn Val Leu  
 85 90 95

Asp Leu Asn Asp Asn Ala Pro Ile Phe  
 100 105

(2) INFORMATION FOR SEQ ID NO:100:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 7 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:100:

Asp Xaa Asp Xaa Gly Xaa Asn  
 1 5

(2) INFORMATION FOR SEQ ID NO:101:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 7 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:101:

Ala Xaa Asp Xaa Gly Xaa Pro  
 1 5

(2) INFORMATION FOR SEQ ID NO:102:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 4650 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 495..4103

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:102:



CCTCTATTCTG ACATTCTCTT TGGATTGTTT TGCTATAACT TGAAATTTGG GATGTCACAA	60
ACGAAACTGT CATCTGTTTC CGCCAAACTG TGTTCTGCT AATCTCCCAG GCTGGCAGCA	120
TTGGAGACTT GCTGACTTCT TTCATCCCCC ACTCTTTTCA CCTGAAATTC CTTTCCTTGG	180
TTTTGCTCTA AGTCCTATGC TTCAGTCAGG GGCCAACCAA ATCTCACTGC CTCCTTTTTA	240
TCATGAAGCC TTTGATCACT GATAGTTCTT TTTATATCTT GAAAAATCAC CCTTCCCAGT	300
ACAGTTAATA TTTAGTATCT CTAATCATCT TGGCACTTAC TCACAGCTCC ATAATTCAGT	360
CGTTTTCTGA CCTCTTCATG GTGATGGGGA GCCCTTTGGA GGTGGTGACT GTGCTTTATA	420
CTCCTCATGA TGCTTCACAT GTGGCAGGCG TGGAGTGCCC GGAGGCGGCC CTCCTGATTC	480
TGGGGCCTCC CAGG ATG GAG CCC CTG AGG CAC AGC CCA GGC CCT GGG GGG	530
Met Glu Pro Leu Arg His Ser Pro Gly Pro Gly Gly	
1 5 10	
CAA CGG CTA CTG CTG CCC TCC ATG CTG CTA GCA CTG CTG CTC CTG CTG	578
Gln Arg Leu Leu Leu Pro Ser Met Leu Leu Ala Leu Leu Leu Leu	
15 20 25	
GCT CCA TCC CCA GGC CAC GCC ACT CGG GTA GTG TAC AAG GTG CCG GAG	626
Ala Pro Ser Pro Gly His Ala Thr Arg Val Val Tyr Lys Val Pro Glu	
30 35 40	
GAA CAG CCA CCC AAC ACC CTC ATT GGG AGC CTC GCA GCC GAC TAT GGT	674
Glu Gln Pro Pro Asn Thr Leu Ile Gly Ser Leu Ala Ala Asp Tyr Gly	
45 50 55 60	
TTT CCA GAT GTG GGG CAC CTG TAC AAG CTA GAG GTG GGT GCC CCG TAC	722
Phe Pro Asp Val Gly His Leu Tyr Lys Leu Glu Val Gly Ala Pro Tyr	
65 70 75	
CTT CGC GTG GAT GGC AAG ACA GGT GAC ATT TTC ACC ACC GAG ACC TCC	770
Leu Arg Val Asp Gly Lys Thr Gly Asp Ile Phe Thr Thr Glu Thr Ser	
80 85 90	
ATC GAC CGT GAG GGG CTC CGT GAA TGC CAG AAC CAG CTC CCT GGT GAT	818
Ile Asp Arg Glu Gly Leu Arg Glu Cys Gln Asn Gln Leu Pro Gly Asp	
95 100 105	
CCC TGC ATC CTG GAG TTT GAG GTA TCT ATC ACA GAC CTC GTG CAG AAT	866
Pro Cys Ile Leu Glu Phe Glu Val Ser Ile Thr Asp Leu Val Gln Asn	
110 115 120	
GCG AGC CCC CGG CTG CTA GAG GGC CAG ATA GAA GTA CAA GAC ATC AAT	914
Ala Ser Pro Arg Leu Leu Glu Gly Gln Ile Glu Val Gln Asp Ile Asn	
125 130 135 140	
GAC AAC ACA CCC AAC TTC GCC TCA CCA GTC ATC ACT CTG GCC ATC CCT	962
Asp Asn Thr Pro Asn Phe Ala Ser Pro Val Ile Thr Leu Ala Ile Pro	
145 150 155	
GAG AAC ACC AAC ATC GGC TCA CTC TTC CCC ATC CCG CTG GCT TCA GAC	1010
Glu Asn Thr Asn Ile Gly Ser Leu Phe Pro Ile Pro Leu Ala Ser Asp	
160 165 170	

CGT GAT GCT GGT CCC AAC GGT GTG GCA TCC TAT GAG CTG CAG GTG GCA Arg Asp Ala Gly Pro Asn Gly Val Ala Ser Tyr Glu Leu Gln Val Ala 175 180 185	1058
GAG GAC CAG GAG GAG AAG CAA CCA CAG CTC ATT GTG ATG GGC AAC CTG Glu Asp Gln Glu Glu Lys Gln Pro Gln Leu Ile Val Met Gly Asn Leu 190 195 200	1106
GAC CGT GAG CGC TGG GAC TCC TAT GAC CTC ACC ATC AAG GTG CAG GAT Asp Arg Glu Arg Trp Asp Ser Tyr Asp Leu Thr Ile Lys Val Gln Asp 205 210 215 220	1154
GGC GGC AGC CCC CCA CGC GCC ACG AGT GCC CTG CTG CGT GTC ACC GTG Gly Gly Ser Pro Pro Arg Ala Thr Ser Ala Leu Leu Arg Val Thr Val 225 230 235	1202
CTT GAC ACC AAT GAC AAC GCC CCC AAG TTT GAG CGG CCC TCC TAT GAG Leu Asp Thr Asn Asp Asn Ala Pro Lys Phe Glu Arg Pro Ser Tyr Glu 240 245 250	1250
GCC GAA CTA TCT GAG AAT AGC CCC ATA GGC CAC TCG GTC ATC CAG GTG Ala Glu Leu Ser Glu Asn Ser Pro Ile Gly His Ser Val Ile Gln Val 255 260 265	1298
AAG GCC AAT GAC TCA GAC CAA GGT GCC AAT GCA GAA ATC GAA TAC ACA Lys Ala Asn Asp Ser Asp Gln Gly Ala Asn Ala Glu Ile Glu Tyr Thr 270 275 280	1346
TTC CAC CAG GCG CCC GAA GTT GTG AGG CGT CTT CTT CGA CTG GAC AGG Phe His Gln Ala Pro Glu Val Val Arg Arg Leu Leu Arg Leu Asp Arg 285 290 295 300	1394
AAC ACT GGA CTT ATC ACT GTT CAG GGC CCG GTG GAC CGT GAG GAC CTA Asn Thr Gly Leu Ile Thr Val Gln Gly Pro Val Asp Arg Glu Asp Leu 305 310 315	1442
AGC ACC CTG CGC TTC TCA GTG CTT GCT AAG GAC CGA GGC ACC AAC CCC Ser Thr Leu Arg Phe Ser Val Leu Ala Lys Asp Arg Gly Thr Asn Pro 320 325 330	1490
AAG AGT GCC CGT GCC CAG GTG GTT GTG ACC GTG AAG GAC ATG AAT GAC Lys Ser Ala Arg Ala Gln Val Val Val Thr Val Lys Asp Met Asn Asp 335 340 345	1538
AAT GCC CCC ACC ATT GAG ATC CGG GGC ATA GGG CTA GTG ACT CAT CAA Asn Ala Pro Thr Ile Glu Ile Arg Gly Ile Gly Leu Val Thr His Gln 350 355 360	1586
GAT GGG ATG GCT AAC ATC TCA GAG GAT GTG GCA GAG GAG ACA GCT GTG Asp Gly Met Ala Asn Ile Ser Glu Asp Val Ala Glu Glu Thr Ala Val 365 370 375 380	1634
GCC CTG GTG CAG GTG TCT GAC CGA GAT GAG GGA GAG AAT GCA GCT GTC Ala Leu Val Gln Val Ser Asp Arg Asp Glu Gly Glu Asn Ala Ala Val 385 390 395	1682
ACC TGT GTG GTG GCA GGT GAT GTG CCC TTC CAG CTG CGC CAG GCC AGT Thr Cys Val Val Ala Gly Asp Val Pro Phe Gln Leu Arg Gln Ala Ser 400 405 410	1730

GAG ACA GGC AGT GAC AGC AAG AAG AAG TAT TTC CTG CAG ACT ACC ACC Glu Thr Gly Ser Asp Ser Lys Lys Lys Tyr Phe Leu Gln Thr Thr Thr 415 420 425	1778
CCG CTA GAC TAC GAG AAG GTC AAA GAC TAC ACC ATT GAG ATT GTG GCT Pro Leu Asp Tyr Glu Lys Val Lys Asp Tyr Thr Ile Glu Ile Val Ala 430 435 440	1826
GTG GAC TCT GGC AAC CCC CCA CTC TCC AGC ACT AAC TCC CTC AAG GTG Val Asp Ser Gly Asn Pro Pro Leu Ser Ser Thr Asn Ser Leu Lys Val 445 450 455 460	1874
CAG GTG GTG GAC GTC AAT GAC AAC GCA CCT GTC TTC ACT CAG AGT GTC Gln Val Val Asp Val Asn Asp Asn Ala Pro Val Phe Thr Gln Ser Val 465 470 475	1922
ACT GAG GTC GCC TTC CCG GAA AAC AAC AAG CCT GGT GAA GTG ATT GCT Thr Glu Val Ala Phe Pro Glu Asn Asn Lys Pro Gly Glu Val Ile Ala 480 485 490	1970
GAG ATC ACT GCC AGT GAT GCT GAC TCT GGC TCT AAT GCT GAG CTG GTT Glu Ile Thr Ala Ser Asp Ala Asp Ser Gly Ser Asn Ala Glu Leu Val 495 500 505	2018
TAC TCT CTG GAG CCT GAG CCG GCT GCT AAG GGC CTC TTC ACC ATC TCA Tyr Ser Leu Glu Pro Glu Pro Ala Ala Lys Gly Leu Phe Thr Ile Ser 510 515 520	2066
CCC GAG ACT GGA GAG ATC CAG GTG AAG ACA TCT CTG GAT CGG GAA CAG Pro Glu Thr Gly Glu Ile Gln Val Lys Thr Ser Leu Asp Arg Glu Gln 525 530 535 540	2114
CGG GAG AGC TAT GAG TTG AAG GTG GTG GCA GCT GAC CGG GGC AGT CCT Arg Glu Ser Tyr Glu Leu Lys Val Val Ala Ala Asp Arg Gly Ser Pro 545 550 555	2162
AGC CTC CAG GGC ACA GCC ACT GTC CTT GTC AAT GTG CTG GAC TGC AAT Ser Leu Gln Gly Thr Ala Thr Val Leu Val Asn Val Leu Asp Cys Asn 560 565 570	2210
GAC AAT GAC CCC AAA TTT ATG CTG AGT GGC TAC AAC TTC TCA GTG ATG Asp Asn Asp Pro Lys Phe Met Leu Ser Gly Tyr Asn Phe Ser Val Met 575 580 585	2258
GAG AAC ATG CCA GCA CTG AGT CCA GTG GGC ATG GTG ACT GTC ATT GAT Glu Asn Met Pro Ala Leu Ser Pro Val Gly Met Val Thr Val Ile Asp 590 595 600	2306
GGA GAC AAG GGG GAG AAT GCC CAG GTG CAG CTC TCA GTG GAG CAG GAC Gly Asp Lys Gly Glu Asn Ala Gln Val Gln Leu Ser Val Glu Gln Asp 605 610 615 620	2354
AAC GGT GAC TTT GTT ATC CAG AAT GGC ACA GGC ACC ATC CTA TCC AGC Asn Gly Asp Phe Val Ile Gln Asn Gly Thr Gly Thr Ile Leu Ser Ser 625 630 635	2402
CTG AGC TTT GAT CGA GAG CAA CAA AGC ACC TAC ACC TTC CAG CTG AAG Leu Ser Phe Asp Arg Glu Gln Gln Ser Thr Tyr Thr Phe Gln Leu Lys 640 645 650	2450

GCA GTG GAT GGT GGC GTC CCA CCT CGC TCA GCT TAC GTT GGT GTC ACC Ala Val Asp Gly Gly Val Pro Pro Arg Ser Ala Tyr Val Gly Val Thr 655 660 665	2498
ATC AAT GTG CTG GAC GAG AAT GAC AAC GCA CCC TAT ATC ACT GCC CCT Ile Asn Val Leu Asp Glu Asn Asp Asn Ala Pro Tyr Ile Thr Ala Pro 670 675 680	2546
TCT AAC ACC TCT CAC AAG CTG CTG ACC CCC CAG ACA CGT CTT GGT GAG Ser Asn Thr Ser His Lys Leu Leu Thr Pro Gln Thr Arg Leu Gly Glu 685 690 695 700	2594
ACG GTC AGC CAG GTG GCA GCC GAG GAC TTT GAC TCT GGT GTC AAT GCC Thr Val Ser Gln Val Ala Ala Glu Asp Phe Asp Ser Gly Val Asn Ala 705 710 715	2642
GAG CTG ATC TAC AGC ATT GCA GGT GGC AAC CCT TAT GGA CTC TTC CAG Glu Leu Ile Tyr Ser Ile Ala Gly Gly Asn Pro Tyr Gly Leu Phe Gln 720 725 730	2690
ATT GGG TCA CAT TCA GGT GCC ATC ACC CTG GAG AAG GAG ATT GAG CGG Ile Gly Ser His Ser Gly Ala Ile Thr Leu Glu Lys Glu Ile Glu Arg 735 740 745	2738
CGC CAC CAT GGG CTA CAC CGC CTG GTG GTG AAG GTC AGT GAC CGC GGC Arg His His Gly Leu His Arg Leu Val Val Lys Val Ser Asp Arg Gly 750 755 760	2786
AAG CCC CCA CGC TAT GGC ACA GCC TTG GTC CAT CTT TAT GTC AAT GAG Lys Pro Pro Arg Tyr Gly Thr Ala Leu Val His Leu Tyr Val Asn Glu 765 770 775 780	2834
ACT CTG GCC AAC CGC ACG CTG CTG GAG ACC CTC CTG GGC CAC AGC CTG Thr Leu Ala Asn Arg Thr Leu Leu Glu Thr Leu Leu Gly His Ser Leu 785 790 795	2882
GAC ACG CCG CTG GAT ATT GAC ATT GCT GGG GAT CCA GAA TAT GAG CGC Asp Thr Pro Leu Asp Ile Asp Ile Ala Gly Asp Pro Glu Tyr Glu Arg 800 805 810	2930
TCC AAG CAG CGT GGC AAC ATT CTC TTT GGT GTG GTG GCT GGT GTG GTG Ser Lys Gln Arg Gly Asn Ile Leu Phe Gly Val Val Ala Gly Val Val 815 820 825	2978
GCC GTG GCC TTG CTC ATC GCC CTG GCG GTT CTT GTG CGC TAC TGC AGA Ala Val Ala Leu Leu Ile Ala Leu Ala Val Leu Val Arg Tyr Cys Arg 830 835 840	3026
CAG CGG GAG GCC AAA AGT GGT TAC CAG GCT GGT AAG AAG GAG ACC AAG Gln Arg Glu Ala Lys Ser Gly Tyr Gln Ala Gly Lys Lys Glu Thr Lys 845 850 855 860	3074
GAC CTG TAT GCC CCC AAG CCC AGT GGC AAG GCC TCC AAG GGA AAC AAA Asp Leu Tyr Ala Pro Lys Pro Ser Gly Lys Ala Ser Lys Gly Asn Lys 865 870 875	3122
AGC AAA GGC AAG AAG AGC AAG TCC CCA AAG CCC GTG AAG CCA GTG GAG Ser Lys Gly Lys Lys Ser Lys Ser Pro Lys Pro Val Lys Pro Val Glu 880 885 890	3170

GAC GAG GAT GAG GCC GGG CTG CAG AAG TCC CTC AAG TTC AAC CTG ATG Asp Glu Asp Glu Ala Gly Leu Gln Lys Ser Leu Lys Phe Asn Leu Met 895 900 905	3218
AGC GAT GCC CCT GGG GAC AGT CCC CGC ATC CAC CTG CCC CTC AAC TAC Ser Asp Ala Pro Gly Asp Ser Pro Arg Ile His Leu Pro Leu Asn Tyr 910 915 920	3266
CCA CCA GGC AGC CCT GAC CTG GGC CGC CAC TAT CGC TCT AAC TCC CCA Pro Pro Gly Ser Pro Asp Leu Gly Arg His Tyr Arg Ser Asn Ser Pro 925 930 935 940	3314
CTG CCT TCC ATC CAG CTG CAG CCC CAG TCA CCC TCA GCC TCC AAG AAG Leu Pro Ser Ile Gln Leu Gln Pro Gln Ser Pro Ser Ala Ser Lys Lys 945 950 955	3362
CAC CAG GTG GTA CAG GAC CTG CCA CCT GCA AAC ACA TTC GTG GGC ACC His Gln Val Val Gln Asp Leu Pro Pro Ala Asn Thr Phe Val Gly Thr 960 965 970	3410
GGG GAC ACC ACG TCC ACG GGC TCT GAG CAG TAC TCC GAC TAC AGC TAC Gly Asp Thr Thr Ser Thr Gly Ser Glu Gln Tyr Ser Asp Tyr Ser Tyr 975 980 985	3458
CGC ACC AAC CCC CCC AAA TAC CCC AGC AAG CAG TTA CCT CAC CGC CGC Arg Thr Asn Pro Pro Lys Tyr Pro Ser Lys Gln Leu Pro His Arg Arg 990 995 1000	3506
GTC ACC TTC TCG GCC ACC AGC CAG GCC CAG GAG CTG CAG GAC CCA TCC Val Thr Phe Ser Ala Thr Ser Gln Ala Gln Glu Leu Gln Asp Pro Ser 1005 1010 1015 1020	3554
CAG CAC AGT TAC TAT GAC AGT GGC CTG GAG GAG TCT GAG ACG CCG TCC Gln His Ser Tyr Tyr Asp Ser Gly Leu Glu Glu Ser Glu Thr Pro Ser 1025 1030 1035	3602
AGC AAG TCA TCC TCA GGG CCT CGA CTC GGT CCC CTG GCC CTG CCT GAG Ser Lys Ser Ser Ser Gly Pro Arg Leu Gly Pro Leu Ala Leu Pro Glu 1040 1045 1050	3650
GAT CAC TAT GAG CGC ACC ACC CCT GAT GGC AGC ATA GGA GAG ATG GAG Asp His Tyr Glu Arg Thr Thr Pro Asp Gly Ser Ile Gly Glu Met Glu 1055 1060 1065	3698
CAC CCC GAG AAT GAC CTT CGC CCT TTG CCT GAT GTC GCC ATG ACA GGC His Pro Glu Asn Asp Leu Arg Pro Leu Pro Asp Val Ala Met Thr Gly 1070 1075 1080	3746
ACA TGT ACC CGG GAG TGC AGT GAG TTT GGC CAC TCT GAC ACA TGC TGG Thr Cys Thr Arg Glu Cys Ser Glu Phe Gly His Ser Asp Thr Cys Trp 1085 1090 1095 1100	3794
ATG CCT GGC CAG TCA TCT CCC AGC CGC CGG ACC AAG AGC AGC GCC CTC Met Pro Gly Gln Ser Ser Pro Ser Arg Arg Thr Lys Ser Ser Ala Leu 1105 1110 1115	3842
AAA CTC TCC ACC TTC ATG CCT TAC CAG GAC CGA GGA GGG CAG GAG CCT Lys Leu Ser Thr Phe Met Pro Tyr Gln Asp Arg Gly Gly Gln Glu Pro 1120 1125 1130	3890

GCG GGC GCC GGC AGC CCC AGC CCC CCG GAA GAC CGG AAC ACC AAA ACG Ala Gly Ala Gly Ser Pro Ser Pro Pro Glu Asp Arg Asn Thr Lys Thr 1135 1140 1145	3938
GCC CCC GTG CGC CTC CTG CCC TCC TAC AGT GCC TTC TCC CAC AGT AGC Ala Pro Val Arg Leu Leu Pro Ser Tyr Ser Ala Phe Ser His Ser Ser 1150 1155 1160	3986
CAT GAT TCC TGC AAG GAC TCG GCC ACC TTG GAG GAA ATC CCC CTG ACC His Asp Ser Cys Lys Asp Ser Ala Thr Leu Glu Glu Ile Pro Leu Thr 1165 1170 1175 1180	4034
CAG ACC TCG GAC TTC CCA CCC GCA GCC ACA CCG GCA TCT GCC CAG ACG Gln Thr Ser Asp Phe Pro Pro Ala Ala Thr Pro Ala Ser Ala Gln Thr 1185 1190 1195	4082
GCC AAG CGC GAG ATC TAC CTG TGAGCCCCCT ACTGGCCGGC CCCCCTCCCC Ala Lys Arg Glu Ile Tyr Leu 1200	4133
CAGCGCCGGC CAGCTCCCAA ATGCCCATTC CAGGGCCTCA CTCTCCACCC CTTCAGCGTG	4193
GACTTCCTGC CAGGGCCCAA GTGGGGGTAT CACTGACCTC ATGACCACGC TGGCCCTTCT	4253
CCCATGCAGG GTCCAGGTCC TCTCCCCTCA TTTCCATCTC CCAGCCCAGG GGCCCCTTCC	4313
CCTTTATGGG GCTTCCCCCA GCTGATGCCC AAGAGGGCTC CTCTGCAATG ACTGGGCTCC	4373
TTCCCTTGAC TTCCAGGGAG CACCCCCTCG ATTTGGGCAG ATGGTGGAGT CAAGGGTGGG	4433
CAGCGTACTT CTAACCTATT GTTTCCTCA TGGCCGACCA GGGCGGGGAT AGCATGCCCA	4493
ATTTTAGCCC TGAAGCAGGG CTGAACTGGG GAGCCCCTTT CCCTGGGAGC TCCCAGAGGA	4553
AACTCTTGAC CACCAGTGGC TCCCTGAAGG GCTTTTGTTA CCAAAGGTGG GGTAGGGACG	4613
GGGGTGGGAG TGGAGCGGAG GCCTTGTTTT CCCGTGG	4650

## (2) INFORMATION FOR SEQ ID NO:103:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1203 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:103:

Met	Glu	Pro	Leu	Arg	His	Ser	Pro	Gly	Pro	Gly	Gly	Gln	Arg	Leu	Leu	1	5	10	15
Leu	Pro	Ser	Met	Leu	Leu	Ala	Leu	Leu	Leu	Leu	Leu	Ala	Pro	Ser	Pro	20	25	30	
Gly	His	Ala	Thr	Arg	Val	Val	Tyr	Lys	Val	Pro	Glu	Glu	Gln	Pro	Pro	35	40	45	

Asn Thr Leu Ile Gly Ser Leu Ala Ala Asp Tyr Gly Phe Pro Asp Val  
 50 55 60  
 Gly His Leu Tyr Lys Leu Glu Val Gly Ala Pro Tyr Leu Arg Val Asp  
 65 70 75 80  
 Gly Lys Thr Gly Asp Ile Phe Thr Thr Glu Thr Ser Ile Asp Arg Glu  
 85 90 95  
 Gly Leu Arg Glu Cys Gln Asn Gln Leu Pro Gly Asp Pro Cys Ile Leu  
 100 105 110  
 Glu Phe Glu Val Ser Ile Thr Asp Leu Val Gln Asn Ala Ser Pro Arg  
 115 120 125  
 Leu Leu Glu Gly Gln Ile Glu Val Gln Asp Ile Asn Asp Asn Thr Pro  
 130 135 140  
 Asn Phe Ala Ser Pro Val Ile Thr Leu Ala Ile Pro Glu Asn Thr Asn  
 145 150 155 160  
 Ile Gly Ser Leu Phe Pro Ile Pro Leu Ala Ser Asp Arg Asp Ala Gly  
 165 170 175  
 Pro Asn Gly Val Ala Ser Tyr Glu Leu Gln Val Ala Glu Asp Gln Glu  
 180 185 190  
 Glu Lys Gln Pro Gln Leu Ile Val Met Gly Asn Leu Asp Arg Glu Arg  
 195 200 205  
 Trp Asp Ser Tyr Asp Leu Thr Ile Lys Val Gln Asp Gly Gly Ser Pro  
 210 215 220  
 Pro Arg Ala Thr Ser Ala Leu Leu Arg Val Thr Val Leu Asp Thr Asn  
 225 230 235 240  
 Asp Asn Ala Pro Lys Phe Glu Arg Pro Ser Tyr Glu Ala Glu Leu Ser  
 245 250 255  
 Glu Asn Ser Pro Ile Gly His Ser Val Ile Gln Val Lys Ala Asn Asp  
 260 265 270  
 Ser Asp Gln Gly Ala Asn Ala Glu Ile Glu Tyr Thr Phe His Gln Ala  
 275 280 285  
 Pro Glu Val Val Arg Arg Leu Leu Arg Leu Asp Arg Asn Thr Gly Leu  
 290 295 300  
 Ile Thr Val Gln Gly Pro Val Asp Arg Glu Asp Leu Ser Thr Leu Arg  
 305 310 315 320  
 Phe Ser Val Leu Ala Lys Asp Arg Gly Thr Asn Pro Lys Ser Ala Arg  
 325 330 335  
 Ala Gln Val Val Val Thr Val Lys Asp Met Asn Asp Asn Ala Pro Thr  
 340 345 350  
 Ile Glu Ile Arg Gly Ile Gly Leu Val Thr His Gln Asp Gly Met Ala  
 355 360 365

Asn Ile Ser Glu Asp Val Ala Glu Glu Thr Ala Val Ala Leu Val Gln  
 370 375 380  
 Val Ser Asp Arg Asp Glu Gly Glu Asn Ala Ala Val Thr Cys Val Val  
 385 390 395 400  
 Ala Gly Asp Val Pro Phe Gln Leu Arg Gln Ala Ser Glu Thr Gly Ser  
 405 410 415  
 Asp Ser Lys Lys Lys Tyr Phe Leu Gln Thr Thr Thr Pro Leu Asp Tyr  
 420 425 430  
 Glu Lys Val Lys Asp Tyr Thr Ile Glu Ile Val Ala Val Asp Ser Gly  
 435 440 445  
 Asn Pro Pro Leu Ser Ser Thr Asn Ser Leu Lys Val Gln Val Val Asp  
 450 455 460  
 Val Asn Asp Asn Ala Pro Val Phe Thr Gln Ser Val Thr Glu Val Ala  
 465 470 475 480  
 Phe Pro Glu Asn Asn Lys Pro Gly Glu Val Ile Ala Glu Ile Thr Ala  
 485 490 495  
 Ser Asp Ala Asp Ser Gly Ser Asn Ala Glu Leu Val Tyr Ser Leu Glu  
 500 505 510  
 Pro Glu Pro Ala Ala Lys Gly Leu Phe Thr Ile Ser Pro Glu Thr Gly  
 515 520 525  
 Glu Ile Gln Val Lys Thr Ser Leu Asp Arg Glu Gln Arg Glu Ser Tyr  
 530 535 540  
 Glu Leu Lys Val Val Ala Ala Asp Arg Gly Ser Pro Ser Leu Gln Gly  
 545 550 555 560  
 Thr Ala Thr Val Leu Val Asn Val Leu Asp Cys Asn Asp Asn Asp Pro  
 565 570 575  
 Lys Phe Met Leu Ser Gly Tyr Asn Phe Ser Val Met Glu Asn Met Pro  
 580 585 590  
 Ala Leu Ser Pro Val Gly Met Val Thr Val Ile Asp Gly Asp Lys Gly  
 595 600 605  
 Glu Asn Ala Gln Val Gln Leu Ser Val Glu Gln Asp Asn Gly Asp Phe  
 610 615 620  
 Val Ile Gln Asn Gly Thr Gly Thr Ile Leu Ser Ser Leu Ser Phe Asp  
 625 630 635 640  
 Arg Glu Gln Gln Ser Thr Tyr Thr Phe Gln Leu Lys Ala Val Asp Gly  
 645 650 655  
 Gly Val Pro Pro Arg Ser Ala Tyr Val Gly Val Thr Ile Asn Val Leu  
 660 665 670  
 Asp Glu Asn Asp Asn Ala Pro Tyr Ile Thr Ala Pro Ser Asn Thr Ser  
 675 680 685



His Lys Leu Leu Thr Pro Gln Thr Arg Leu Gly Glu Thr Val Ser Gln  
 690 695 700  
 Val Ala Ala Glu Asp Phe Asp Ser Gly Val Asn Ala Glu Leu Ile Tyr  
 705 710 715 720  
 Ser Ile Ala Gly Gly Asn Pro Tyr Gly Leu Phe Gln Ile Gly Ser His  
 725 730 735  
 Ser Gly Ala Ile Thr Leu Glu Lys Glu Ile Glu Arg Arg His His Gly  
 740 745 750  
 Leu His Arg Leu Val Val Lys Val Ser Asp Arg Gly Lys Pro Pro Arg  
 755 760 765  
 Tyr Gly Thr Ala Leu Val His Leu Tyr Val Asn Glu Thr Leu Ala Asn  
 770 775 780  
 Arg Thr Leu Leu Glu Thr Leu Leu Gly His Ser Leu Asp Thr Pro Leu  
 785 790 795 800  
 Asp Ile Asp Ile Ala Gly Asp Pro Glu Tyr Glu Arg Ser Lys Gln Arg  
 805 810 815  
 Gly Asn Ile Leu Phe Gly Val Val Ala Gly Val Val Ala Val Ala Leu  
 820 825 830  
 Leu Ile Ala Leu Ala Val Leu Val Arg Tyr Cys Arg Gln Arg Glu Ala  
 835 840 845  
 Lys Ser Gly Tyr Gln Ala Gly Lys Lys Glu Thr Lys Asp Leu Tyr Ala  
 850 855 860  
 Pro Lys Pro Ser Gly Lys Ala Ser Lys Gly Asn Lys Ser Lys Gly Lys  
 865 870 875 880  
 Lys Ser Lys Ser Pro Lys Pro Val Lys Pro Val Glu Asp Glu Asp Glu  
 885 890 895  
 Ala Gly Leu Gln Lys Ser Leu Lys Phe Asn Leu Met Ser Asp Ala Pro  
 900 905 910  
 Gly Asp Ser Pro Arg Ile His Leu Pro Leu Asn Tyr Pro Pro Gly Ser  
 915 920 925  
 Pro Asp Leu Gly Arg His Tyr Arg Ser Asn Ser Pro Leu Pro Ser Ile  
 930 935 940  
 Gln Leu Gln Pro Gln Ser Pro Ser Ala Ser Lys Lys His Gln Val Val  
 945 950 955 960  
 Gln Asp Leu Pro Pro Ala Asn Thr Phe Val Gly Thr Gly Asp Thr Thr  
 965 970 975  
 Ser Thr Gly Ser Glu Gln Tyr Ser Asp Tyr Ser Tyr Arg Thr Asn Pro  
 980 985 990  
 Pro Lys Tyr Pro Ser Lys Gln Leu Pro His Arg Arg Val Thr Phe Ser  
 995 1000 1005

Ala Thr Ser Gln Ala Gln Glu Leu Gln Asp Pro Ser Gln His Ser Tyr  
 1010 1015 1020

Tyr Asp Ser Gly Leu Glu Glu Ser Glu Thr Pro Ser Ser Lys Ser Ser  
 1025 1030 1035 1040

Ser Gly Pro Arg Leu Gly Pro Leu Ala Leu Pro Glu Asp His Tyr Glu  
 1045 1050 1055

Arg Thr Thr Pro Asp Gly Ser Ile Gly Glu Met Glu His Pro Glu Asn  
 1060 1065 1070

Asp Leu Arg Pro Leu Pro Asp Val Ala Met Thr Gly Thr Cys Thr Arg  
 1075 1080 1085

Glu Cys Ser Glu Phe Gly His Ser Asp Thr Cys Trp Met Pro Gly Gln  
 1090 1095 1100

Ser Ser Pro Ser Arg Arg Thr Lys Ser Ser Ala Leu Lys Leu Ser Thr  
 1105 1110 1115 1120

Phe Met Pro Tyr Gln Asp Arg Gly Gly Gln Glu Pro Ala Gly Ala Gly  
 1125 1130 1135

Ser Pro Ser Pro Pro Glu Asp Arg Asn Thr Lys Thr Ala Pro Val Arg  
 1140 1145 1150

Leu Leu Pro Ser Tyr Ser Ala Phe Ser His Ser Ser His Asp Ser Cys  
 1155 1160 1165

Lys Asp Ser Ala Thr Leu Glu Glu Ile Pro Leu Thr Gln Thr Ser Asp  
 1170 1175 1180

Phe Pro Pro Ala Ala Thr Pro Ala Ser Ala Gln Thr Ala Lys Arg Glu  
 1185 1190 1195 1200

Ile Tyr Leu

## (2) INFORMATION FOR SEQ ID NO:104:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 2789 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: cDNA

## (ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 115..2622

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:104:

CGAAAGCCAT GTCGGACTCG TCGCCAGCG CCAAGCGCT AACCCGCTGA AAGTTTCTCA 60

GCGAAATCTC AGGGACGATC TGGACCCCGC TGAGAGGAAC TGCTTTTGAG TGAG ATG 117  
 Met

GTC CCA GAG GCC TGG AGG AGC GGA CTG GTA AGC ACC GGG AGG GTA GTG Val Pro Glu Ala Trp Arg Ser Gly Leu Val Ser Thr Gly Arg Val Val	165
5 10 15	
GGA GTT TTG CTT CTG CTT GGT GCC TTG AAC AAG GCT TCC ACG GTC ATT Gly Val Leu Leu Leu Leu Gly Ala Leu Asn Lys Ala Ser Thr Val Ile	213
20 25 30	
CAC TAT GAG ATC CCG GAG GAA AGA GAG AAG GGT TTC GCT GTG GGC AAC His Tyr Glu Ile Pro Glu Glu Arg Glu Lys Gly Phe Ala Val Gly Asn	261
35 40 45	
GTG GTC GCG AAC CTT GGT TTG GAT CTC GGT AGC CTC TCA GCC CGC AGG Val Val Ala Asn Leu Gly Leu Asp Leu Gly Ser Leu Ser Ala Arg Arg	309
50 55 60 65	
TTC CCG GTG GTG TCT GGA GCT AGC CGA AGA TTC TTT GAG GTG AAC CGG Phe Pro Val Val Ser Gly Ala Ser Arg Arg Phe Phe Glu Val Asn Arg	357
70 75 80	
GAG ACC GGA GAG ATG TTT GTG AAC GAC CGT CTG GAT CGA GAG GAG CTG Glu Thr Gly Glu Met Phe Val Asn Asp Arg Leu Asp Arg Glu Glu Leu	405
85 90 95	
TGT GGG ACA CTG CCC TCT TGC ACT GTA ACT CTG GAG TTG GTA GTG GAG Cys Gly Thr Leu Pro Ser Cys Thr Val Thr Leu Glu Val Val Glu	453
100 105 110	
AAC CCG CTG GAG CTG TTC AGC GTG GAA GTG GTG ATC CAG GAC ATC AAC Asn Pro Leu Glu Leu Phe Ser Val Glu Val Val Ile Gln Asp Ile Asn	501
115 120 125	
GAC AAC AAT CCT GCT TTC CCT ACC CAG GAA ATG AAA TTG GAG ATT AGC Asp Asn Asn Pro Ala Phe Pro Thr Gln Glu Met Lys Leu Glu Ile Ser	549
130 135 140 145	
GAG GCC GTG GCT CCG GGG ACG CGC TTT CCG CTC GAG AGC GCG CAC GAT Glu Ala Val Ala Pro Gly Thr Arg Phe Pro Leu Glu Ser Ala His Asp	597
150 155 160	
CCC GAT CTG GGA AGC AAC TCT TTA CAA ACC TAT GAG CTG AGC CGA AAT Pro Asp Leu Gly Ser Asn Ser Leu Gln Thr Tyr Glu Leu Ser Arg Asn	645
165 170 175	
GAA TAC TTT GCG CTT CGC GTG CAG ACG CGG GAG GAC AGC ACC AAG TAC Glu Tyr Phe Ala Leu Arg Val Gln Thr Arg Glu Asp Ser Thr Lys Tyr	693
180 185 190	
GCG GAG CTG GTG TTG GAG CGC GCC CTG GAC CGA GAA CGG GAG CCT AGT Ala Glu Leu Val Leu Glu Arg Ala Leu Asp Arg Glu Arg Glu Pro Ser	741
195 200 205	
CTC CAG TTA GTG CTG ACG GCG TTG GAC GGA GGG ACC CCA GCT CTC TCC Leu Gln Leu Val Leu Thr Ala Leu Asp Gly Gly Thr Pro Ala Leu Ser	789
210 215 220 225	
GCC AGC CTG CCT ATT CAC ATC AAG GTG CTG GAC GCG AAT GAC AAT GCG Ala Ser Leu Pro Ile His Ile Lys Val Leu Asp Ala Asn Asp Asn Ala	837
230 235 240	

CCT GTC TTC AAC CAG TCC TTG TAC CGG GCG CGC GTT CCT GGA GGA TGC Pro Val Phe Asn Gln Ser Leu Tyr Arg Ala Arg Val Pro Gly Gly Cys 245 250 255	885
ACC TCC GGC ACG CGC GTG GTA CAA GTC CTT GCA ACG GAT CTG GAT GAA Thr Ser Gly Thr Arg Val Val Gln Val Leu Ala Thr Asp Leu Asp Glu 260 265 270	933
GGC CCC AAC GGT GAA ATT ATT TAC TCC TTC GGC AGC CAC AAC CGC GCC Gly Pro Asn Gly Glu Ile Ile Tyr Ser Phe Gly Ser His Asn Arg Ala 275 280 285	981
GGC GTG CGG CAA CTA TTC GCC TTA GAC CTT GTA ACC GGG ATG CTG ACA Gly Val Arg Gln Leu Phe Ala Leu Asp Leu Val Thr Gly Met Leu Thr 290 295 300 305	1029
ATC AAG GGT CGG CTG GAC TTC GAG GAC ACC AAA CTC CAT GAG ATT TAC Ile Lys Gly Arg Leu Asp Phe Glu Asp Thr Lys Leu His Glu Ile Tyr 310 315 320	1077
ATC CAG GCC AAA GAC AAG GGC GCC AAT CCC GAA GGA GCA CAT TGC AAA Ile Gln Ala Lys Asp Lys Gly Ala Asn Pro Glu Gly Ala His Cys Lys 325 330 335	1125
GTG TTG GTG GAG GTT GTG GAT GTG AAT GAC AAC GCC CCG GAG ATC ACA Val Leu Val Glu Val Val Asp Val Asn Asp Asn Ala Pro Glu Ile Thr 340 345 350	1173
GTC ACC TCC GTG TAC AGC CCA GTA CCC GAG GAT GCC TCT GGG ACT GTC Val Thr Ser Val Tyr Ser Pro Val Pro Glu Asp Ala Ser Gly Thr Val 355 360 365	1221
ATC GCT TTG CTC AGT GTG ACT GAC CTG GAT GCT GGC GAG AAC GGG CTG Ile Ala Leu Leu Ser Val Thr Asp Leu Asp Ala Gly Glu Asn Gly Leu 370 375 380 385	1269
GTG ACC TGC GAA GTT CCA CCG GGT CTC CCT TTC AGC CTT ACT TCT TCC Val Thr Cys Glu Val Pro Pro Gly Leu Pro Phe Ser Leu Thr Ser Ser 390 395 400	1317
CTC AAG AAT TAC TTC ACT TTG AAA ACC AGT GCA GAC CTG GAT CGG GAG Leu Lys Asn Tyr Phe Thr Leu Lys Thr Ser Ala Asp Leu Asp Arg Glu 405 410 415	1365
ACT GTG CCA GAA TAC AAC CTC AGC ATC ACC GCC CGA GAC GCC GGA ACC Thr Val Pro Glu Tyr Asn Leu Ser Ile Thr Ala Arg Asp Ala Gly Thr 420 425 430	1413
CCT TCC CTC TCA GCC CTT ACA ATA GTG CGT GTT CAA GTG TCC GAC ATC Pro Ser Leu Ser Ala Leu Thr Ile Val Arg Val Gln Val Ser Asp Ile 435 440 445	1461
AAT GAC AAC CCT CCA CAA TCT TCT CAA TCT TCC TAC GAC GTT TAC ATT Asn Asp Asn Pro Pro Gln Ser Ser Gln Ser Ser Tyr Asp Val Tyr Ile 450 455 460 465	1509

GAA GAA AAC AAC CTC CCC GGG GCT CCA ATA CTA AAC CTA AGT GTC TGG Glu Glu Asn Asn Leu Pro Gly Ala Pro Ile Leu Asn Leu Ser Val Trp 470 475 480	1557
GAC CCC GAC GCC CCG CAG AAT GCT CGG CTT TCT TTC TTT CTC TTG GAG Asp Pro Asp Ala Pro Gln Asn Ala Arg Leu Ser Phe Phe Leu Leu Glu 485 490 495	1605
CAA GGA GCT GAA ACC GGG CTA GTG GGT CGC TAT TTC ACA ATA AAT CGT Gln Gly Ala Glu Thr Gly Leu Val Gly Arg Tyr Phe Thr Ile Asn Arg 500 505 510	1653
GAC AAT GGC ATA GTG TCA TCC TTA GTG CCC CTA GAC TAT GAG GAT CGG Asp Asn Gly Ile Val Ser Ser Leu Val Pro Leu Asp Tyr Glu Asp Arg 515 520 525	1701
CGG GAA TTT GAA TTA ACA GCT CAT ATC AGC GAT GGG GGC ACC CCG GTC Arg Glu Phe Glu Leu Thr Ala His Ile Ser Asp Gly Gly Thr Pro Val 530 535 540 545	1749
CTA GCC ACC AAC ATC AGC GTG AAC ATA TTT GTC ACT GAT CGC AAT GAC Leu Ala Thr Asn Ile Ser Val Asn Ile Phe Val Thr Asp Arg Asn Asp 550 555 560	1797
AAT GCC CCC CAG GTC CTA TAT CCT CGG CCA GGT GGG AGC TCG GTG GAG Asn Ala Pro Gln Val Leu Tyr Pro Arg Pro Gly Gly Ser Ser Val Glu 565 570 575	1845
ATG CTG CCT CGA GGT ACC TCA GCT GGC CAC CTA GTG TCA CGG GTG GTA Met Leu Pro Arg Gly Thr Ser Ala Gly His Leu Val Ser Arg Val Val 580 585 590	1893
GGC TGG GAC GCG GAT GCA GGG CAC AAT GCC TGG CTC TCC TAC AGT CTC Gly Trp Asp Ala Asp Ala Gly His Asn Ala Trp Leu Ser Tyr Ser Leu 595 600 605	1941
TTT GGA TCC CCT AAC CAG AGC CTT TTT GCC ATA GGG CTG CAC ACT GGT Phe Gly Ser Pro Asn Gln Ser Leu Phe Ala Ile Gly Leu His Thr Gly 610 615 620 625	1989
CAA ATC AGT ACT GCC CGT CCA GTC CAA GAC ACA GAT TCA CCC AGG CAG Gln Ile Ser Thr Ala Arg Pro Val Gln Asp Thr Asp Ser Pro Arg Gln 630 635 640	2037
ACT CTC ACT GTC TTG ATC AAA GAC AAT GGG GAG CCT TCG CTC TCC ACC Thr Leu Thr Val Leu Ile Lys Asp Asn Gly Glu Pro Ser Leu Ser Thr 645 650 655	2085
ACT GCT ACC CTC ACT GTG TCA GTA ACC GAG GAC TCT CCT GAA GCC CGA Thr Ala Thr Leu Thr Val Ser Val Thr Glu Asp Ser Pro Glu Ala Arg 660 665 670	2133
GCC GAG TTC CCC TCT GGC TCT GCC CCC CGG GAG CAG AAA AAA AAT CTC Ala Glu Phe Pro Ser Gly Ser Ala Pro Arg Glu Gln Lys Lys Asn Leu 675 680 685	2181
ACC TTT TAT CTA CTT CTT TCT CTA ATC CTG GTT TCT GTG GGC TTC GTG Thr Phe Tyr Leu Leu Leu Ser Leu Ile Leu Val Ser Val Gly Phe Val 690 695 700 705	2229

GTC ACA GTG TTC GGA GTA ATC ATA TTC AAA GTT TAC AAG TGG AAG CAG Val Thr Val Phe Gly Val Ile Ile Phe Lys Val Tyr Lys Trp Lys Gln 710 715 720	2277
TCT AGA GAC CTA TAC CGA GCC CCG GTG AGC TCA CTG TAC CGA ACA CCA Ser Arg Asp Leu Tyr Arg Ala Pro Val Ser Ser Leu Tyr Arg Thr Pro 725 730 735	2325
GGG CCC TCC TTG CAC GCG GAC GCC GTG CGG GGA GGC CTG ATG TCG CCG Gly Pro Ser Leu His Ala Asp Ala Val Arg Gly Gly Leu Met Ser Pro 740 745 750	2373
CAC CTT TAC CAT CAG GTG TAT CTC ACC ACG GAC TCC CGC CGC AGC GAC His Leu Tyr His Gln Val Tyr Leu Thr Thr Asp Ser Arg Arg Ser Asp 755 760 765	2421
CCG CTG CTG AAG AAA CCT GGT GCA GCC AGT CCA CTG GCC AGC CGC CAG Pro Leu Leu Lys Lys Pro Gly Ala Ala Ser Pro Leu Ala Ser Arg Gln 770 775 780 785	2469
AAC ACG CTG CGG AGC TGT GAT CCG GTG TTC TAT AGG CAG GTG TTG GGT Asn Thr Leu Arg Ser Cys Asp Pro Val Phe Tyr Arg Gln Val Leu Gly 790 795 800	2517
GCA GAG AGC GCC CCT CCC GGA CAG GTA AGG TTT AGC AAG TCA TGC TTG Ala Glu Ser Ala Pro Pro Gly Gln Val Arg Phe Ser Lys Ser Cys Leu 805 810 815	2565
ACC CTG TTA GTG CCT TTT TAT TCC TAC ATC ATA TTG AGA AGG CTG GAG Thr Leu Leu Val Pro Phe Tyr Ser Tyr Ile Ile Leu Arg Arg Leu Glu 820 825 830	2613
CTG TTT TTT TAGTGATGAA GATGTTTTCC TGGTGATGCA TTCACACTTT Leu Phe Phe 835	2662
CAACTGGCTC TTCCTAGATC AAAGTTAGTG CCTTTGTGAG ATGGTGGCCT GCCAGAGTGT	2722
GGTTTGTGGT CCCATTTTCAG GGGGAAGATA CTTGACTCAT CTGTGGACCT AATTCACATC	2782
CTCAGCG	2789

## (2) INFORMATION FOR SEQ ID NO:105:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 836 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:105:

Met Val Pro Glu Ala Trp Arg Ser Gly Leu Val Ser Thr Gly Arg Val 1 5 10 15
Val Gly Val Leu Leu Leu Leu Gly Ala Leu Asn Lys Ala Ser Thr Val 20 25 30
Ile His Tyr Glu Ile Pro Glu Glu Arg Glu Lys Gly Phe Ala Val Gly 35 40 45

Asn Val Val Ala Asn Leu Gly Leu Asp Leu Gly Ser Leu Ser Ala Arg  
 50 55 60  
 Arg Phe Pro Val Val Ser Gly Ala Ser Arg Arg Phe Phe Glu Val Asn  
 65 70 75 80  
 Arg Glu Thr Gly Glu Met Phe Val Asn Asp Arg Leu Asp Arg Glu Glu  
 85 90 95  
 Leu Cys Gly Thr Leu Pro Ser Cys Thr Val Thr Leu Glu Leu Val Val  
 100 105 110  
 Glu Asn Pro Leu Glu Leu Phe Ser Val Glu Val Val Ile Gln Asp Ile  
 115 120 125  
 Asn Asp Asn Asn Pro Ala Phe Pro Thr Gln Glu Met Lys Leu Glu Ile  
 130 135 140  
 Ser Glu Ala Val Ala Pro Gly Thr Arg Phe Pro Leu Glu Ser Ala His  
 145 150 155 160  
 Asp Pro Asp Leu Gly Ser Asn Ser Leu Gln Thr Tyr Glu Leu Ser Arg  
 165 170 175  
 Asn Glu Tyr Phe Ala Leu Arg Val Gln Thr Arg Glu Asp Ser Thr Lys  
 180 185 190  
 Tyr Ala Glu Leu Val Leu Glu Arg Ala Leu Asp Arg Glu Arg Glu Pro  
 195 200 205  
 Ser Leu Gln Leu Val Leu Thr Ala Leu Asp Gly Gly Thr Pro Ala Leu  
 210 215 220  
 Ser Ala Ser Leu Pro Ile His Ile Lys Val Leu Asp Ala Asn Asp Asn  
 225 230 235 240  
 Ala Pro Val Phe Asn Gln Ser Leu Tyr Arg Ala Arg Val Pro Gly Gly  
 245 250 255  
 Cys Thr Ser Gly Thr Arg Val Val Gln Val Leu Ala Thr Asp Leu Asp  
 260 265 270  
 Glu Gly Pro Asn Gly Glu Ile Ile Tyr Ser Phe Gly Ser His Asn Arg  
 275 280 285  
 Ala Gly Val Arg Gln Leu Phe Ala Leu Asp Leu Val Thr Gly Met Leu  
 290 295 300  
 Thr Ile Lys Gly Arg Leu Asp Phe Glu Asp Thr Lys Leu His Glu Ile  
 305 310 315 320  
 Tyr Ile Gln Ala Lys Asp Lys Gly Ala Asn Pro Glu Gly Ala His Cys  
 325 330 335  
 Lys Val Leu Val Glu Val Val Asp Val Asn Asp Asn Ala Pro Glu Ile  
 340 345 350  
 Thr Val Thr Ser Val Tyr Ser Pro Val Pro Glu Asp Ala Ser Gly Thr  
 355 360 365

Val Ile Ala Leu Leu Ser Val Thr Asp Leu Asp Ala Gly Glu Asn Gly  
 370 375 380  
 Leu Val Thr Cys Glu Val Pro Pro Gly Leu Pro Phe Ser Leu Thr Ser  
 385 390 395 400  
 Ser Leu Lys Asn Tyr Phe Thr Leu Lys Thr Ser Ala Asp Leu Asp Arg  
 405 410 415  
 Glu Thr Val Pro Glu Tyr Asn Leu Ser Ile Thr Ala Arg Asp Ala Gly  
 420 425 430  
 Thr Pro Ser Leu Ser Ala Leu Thr Ile Val Arg Val Gln Val Ser Asp  
 435 440 445  
 Ile Asn Asp Asn Pro Pro Gln Ser Ser Gln Ser Ser Tyr Asp Val Tyr  
 450 455 460  
 Ile Glu Glu Asn Asn Leu Pro Gly Ala Pro Ile Leu Asn Leu Ser Val  
 465 470 475 480  
 Trp Asp Pro Asp Ala Pro Gln Asn Ala Arg Leu Ser Phe Phe Leu Leu  
 485 490 495  
 Glu Gln Gly Ala Glu Thr Gly Leu Val Gly Arg Tyr Phe Thr Ile Asn  
 500 505 510  
 Arg Asp Asn Gly Ile Val Ser Ser Leu Val Pro Leu Asp Tyr Glu Asp  
 515 520 525  
 Arg Arg Glu Phe Glu Leu Thr Ala His Ile Ser Asp Gly Gly Thr Pro  
 530 535 540  
 Val Leu Ala Thr Asn Ile Ser Val Asn Ile Phe Val Thr Asp Arg Asn  
 545 550 555 560  
 Asp Asn Ala Pro Gln Val Leu Tyr Pro Arg Pro Gly Gly Ser Ser Val  
 565 570 575  
 Glu Met Leu Pro Arg Gly Thr Ser Ala Gly His Leu Val Ser Arg Val  
 580 585 590  
 Val Gly Trp Asp Ala Asp Ala Gly His Asn Ala Trp Leu Ser Tyr Ser  
 595 600 605  
 Leu Phe Gly Ser Pro Asn Gln Ser Leu Phe Ala Ile Gly Leu His Thr  
 610 615 620  
 Gly Gln Ile Ser Thr Ala Arg Pro Val Gln Asp Thr Asp Ser Pro Arg  
 625 630 635 640  
 Gln Thr Leu Thr Val Leu Ile Lys Asp Asn Gly Glu Pro Ser Leu Ser  
 645 650 655  
 Thr Thr Ala Thr Leu Thr Val Ser Val Thr Glu Asp Ser Pro Glu Ala  
 660 665 670  
 Arg Ala Glu Phe Pro Ser Gly Ser Ala Pro Arg Glu Gln Lys Lys Asn  
 675 680 685



Leu Thr Phe Tyr Leu Leu Leu Ser Leu Ile Leu Val Ser Val Gly Phe  
 690 695 700  
 Val Val Thr Val Phe Gly Val Ile Ile Phe Lys Val Tyr Lys Trp Lys  
 705 710 715 720  
 Gln Ser Arg Asp Leu Tyr Arg Ala Pro Val Ser Ser Leu Tyr Arg Thr  
 725 730 735  
 Pro Gly Pro Ser Leu His Ala Asp Ala Val Arg Gly Gly Leu Met Ser  
 740 745 750  
 Pro His Leu Tyr His Gln Val Tyr Leu Thr Thr Asp Ser Arg Arg Ser  
 755 760 765  
 Asp Pro Leu Leu Lys Lys Pro Gly Ala Ala Ser Pro Leu Ala Ser Arg  
 770 775 780  
 Gln Asn Thr Leu Arg Ser Cys Asp Pro Val Phe Tyr Arg Gln Val Leu  
 785 790 795 800  
 Gly Ala Glu Ser Ala Pro Pro Gly Gln Val Arg Phe Ser Lys Ser Cys  
 805 810 815  
 Leu Thr Leu Leu Val Pro Phe Tyr Ser Tyr Ile Ile Leu Arg Arg Leu  
 820 825 830  
 Glu Leu Phe Phe  
 835

## (2) INFORMATION FOR SEQ ID NO:106:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 2751 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: cDNA

## (ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 115..2160

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:106:

CGAAAGCCAT GTCGGACTCG TCGCCCAGCG CCCAAGCGCT AACCCGCTGA AAGTTTCTCA 60  
 GCGAAATCTC AGGGACGATC TGGACCCCGC TGAGAGGAAC TGCTTTTGAG TGAG ATG 117  
 Met  
 1  
 GTC CCA GAG GCC TGG AGG AGC GGA CTG GTA AGC ACC GGG AGG GTA GTG 165  
 Val Pro Glu Ala Trp Arg Ser Gly Leu Val Ser Thr Gly Arg Val Val  
 5 10 15  
 GGA GTT TTG CTT CTG CTT GGT GCC TTG AAC AAG GCT TCC ACG GTC ATT 213  
 Gly Val Leu Leu Leu Leu Gly Ala Leu Asn Lys Ala Ser Thr Val Ile  
 20 25 30

CAC TAT GAG ATC CCG GAG GAA AGA GAG AAG GGT TTC GCT GTG GGC AAC His Tyr Glu Ile Pro Glu Glu Arg Glu Lys Gly Phe Ala Val Gly Asn 35 40 45	261
GTG GTC GCG AAC CTT GGT TTG GAT CTC GGT AGC CTC TCA GCC CGC AGG Val Val Ala Asn Leu Gly Leu Asp Leu Gly Ser Leu Ser Ala Arg Arg 50 55 60 65	309
TTC CCG GTG GTG TCT GGA GCT AGC CGA AGA TTC TTT GAG GTG AAC CGG Phe Pro Val Val Ser Gly Ala Ser Arg Arg Phe Phe Glu Val Asn Arg 70 75 80	357
GAG ACC GGA GAG ATG TTT GTG AAC GAC CGT CTG GAT CGA GAG GAG CTG Glu Thr Gly Glu Met Phe Val Asn Asp Arg Leu Asp Arg Glu Glu Leu 85 90 95	405
TGT GGG ACA CTG CCC TCT TGC ACT GTA ACT CTG GAG TTG GTA GTG GAG Cys Gly Thr Leu Pro Ser Cys Thr Val Thr Leu Glu Leu Val Val Glu 100 105 110	453
AAC CCG CTG GAG CTG TTC AGC GTG GAA GTG GTG ATC CAG GAC ATC AAC Asn Pro Leu Glu Leu Phe Ser Val Glu Val Val Ile Gln Asp Ile Asn 115 120 125	501
GAC AAC AAT CCT GCT TTC CCT ACC CAG GAA ATG AAA TTG GAG ATT AGC Asp Asn Asn Pro Ala Phe Pro Thr Gln Glu Met Lys Leu Glu Ile Ser 130 135 140 145	549
GAG GCC GTG GCT CCG GGG ACG CGC TTT CCG CTC GAG AGC GCG CAC GAT Glu Ala Val Ala Pro Gly Thr Arg Phe Pro Leu Glu Ser Ala His Asp 150 155 160	597
CCC GAT CTG GGA AGC AAC TCT TTA CAA ACC TAT GAG CTG AGC CGA AAT Pro Asp Leu Gly Ser Asn Ser Leu Gln Thr Tyr Glu Leu Ser Arg Asn 165 170 175	645
GAA TAC TTT GCG CTT CGC GTG CAG ACG CGG GAG GAC AGC ACC AAG TAC Glu Tyr Phe Ala Leu Arg Val Gln Thr Arg Glu Asp Ser Thr Lys Tyr 180 185 190	693
GCG GAG CTG GTG TTG GAG CGC GCC CTG GAC CGA GAA CGG GAG CCT AGT Ala Glu Leu Val Leu Glu Arg Ala Leu Asp Arg Glu Arg Glu Pro Ser 195 200 205	741
CTC CAG TTA GTG CTG ACG GCG TTG GAC GGA GGG ACC CCA GCT CTC TCC Leu Gln Leu Val Leu Thr Ala Leu Asp Gly Gly Thr Pro Ala Leu Ser 210 215 220 225	789
GCC AGC CTG CCT ATT CAC ATC AAG GTG CTG GAC GCG AAT GAC AAT GCG Ala Ser Leu Pro Ile His Ile Lys Val Leu Asp Ala Asn Asp Asn Ala 230 235 240	837
CCT GTC TTC AAC CAG TCC TTG TAC CGG GCG CGC GTT CCT GGA GGA TGC Pro Val Phe Asn Gln Ser Leu Tyr Arg Ala Arg Val Pro Gly Gly Cys 245 250 255	885
ACC TCC GGC ACG CGC GTG GTA CAA GTC CTT GCA ACG GAT CTG GAT GAA Thr Ser Gly Thr Arg Val Val Gln Val Leu Ala Thr Asp Leu Asp Glu 260 265 270	933

GGC CCC AAC GGT GAA ATT ATT TAC TCC TTC GGC AGC CAC AAC CGC GCC Gly Pro Asn Gly Glu Ile Ile Tyr Ser Phe Gly Ser His Asn Arg Ala 275 280 285	981
GGC GTG CGG CAA CTA TTC GCC TTA GAC CTT GTA ACC GGG ATG CTG ACA Gly Val Arg Gln Leu Phe Ala Leu Asp Leu Val Thr Gly Met Leu Thr 290 295 300 305	1029
ATC AAG GGT CGG CTG GAC TTC GAG GAC ACC AAA CTC CAT GAG ATT TAC Ile Lys Gly Arg Leu Asp Phe Glu Asp Thr Lys Leu His Glu Ile Tyr 310 315 320	1077
ATC CAG GCC AAA GAC AAG GGC GCC AAT CCC GAA GGA GCA CAT TGC AAA Ile Gln Ala Lys Asp Lys Gly Ala Asn Pro Glu Gly Ala His Cys Lys 325 330 335	1125
GTG TTG GTG GAG GTT GTG GAT GTG AAT GAC AAC GCC CCG GAG ATC ACA Val Leu Val Glu Val Val Asp Val Asn Asp Asn Ala Pro Glu Ile Thr 340 345 350	1173
GTC ACC TCC GTG TAC AGC CCA GTA CCC GAG GAT GCC TCT GGG ACT GTC Val Thr Ser Val Tyr Ser Pro Val Pro Glu Asp Ala Ser Gly Thr Val 355 360 365	1221
ATC GCT TTG CTC AGT GTG ACT GAC CTG GAT GCT GGC GAG AAC GGG CTG Ile Ala Leu Leu Ser Val Thr Asp Leu Asp Ala Gly Glu Asn Gly Leu 370 375 380 385	1269
GTG ACC TGC GAA GTT CCA CCG GGT CTC CCT TTC AGC CTT ACT TCT TCC Val Thr Cys Glu Val Pro Pro Gly Leu Pro Phe Ser Leu Thr Ser Ser 390 395 400	1317
CTC AAG AAT TAC TTC ACT TTG AAA ACC AGT GCA GAC CTG GAT CGG GAG Leu Lys Asn Tyr Phe Thr Leu Lys Thr Ser Ala Asp Leu Asp Arg Glu 405 410 415	1365
ACT GTG CCA GAA TAC AAC CTC AGC ATC ACC GCC CGA GAC GCC GGA ACC Thr Val Pro Glu Tyr Asn Leu Ser Ile Thr Ala Arg Asp Ala Gly Thr 420 425 430	1413
CCT TCC CTC TCA GCC CTT ACA ATA GTG CGT GTT CAA GTG TCC GAC ATC Pro Ser Leu Ser Ala Leu Thr Ile Val Arg Val Gln Val Ser Asp Ile 435 440 445	1461
AAT GAC AAC CCT CCA CAA TCT TCT CAA TCT TCC TAC GAC GTT TAC ATT Asn Asp Asn Pro Pro Gln Ser Ser Gln Ser Ser Tyr Asp Val Tyr Ile 450 455 460 465	1509
GAA GAA AAC AAC CTC CCC GGG GCT CCA ATA CTA AAC CTA AGT GTC TGG Glu Glu Asn Asn Leu Pro Gly Ala Pro Ile Leu Asn Leu Ser Val Trp 470 475 480	1557
GAC CCC GAC GCC CCG CAG AAT GCT CGG CTT TCT TTC TTT CTC TTG GAG Asp Pro Asp Ala Pro Gln Asn Ala Arg Leu Ser Phe Phe Leu Leu Glu 485 490 495	1605
CAA GGA GCT GAA ACC GGG CTA GTG GGT CGC TAT TTC ACA ATA AAT CGT Gln Gly Ala Glu Thr Gly Leu Val Gly Arg Tyr Phe Thr Ile Asn Arg 500 505 510	1653

GAC AAT GGC ATA GTG TCA TCC TTA GTG CCC CTA GAC TAT GAG GAT CGG Asp Asn Gly Ile Val Ser Ser Leu Val Pro Leu Asp Tyr Glu Asp Arg 515 520 525	1701
CGG GAA TTT GAA TTA ACA GCT CAT ATC AGC GAT GGG GGC ACC CCG GTC Arg Glu Phe Glu Leu Thr Ala His Ile Ser Asp Gly Gly Thr Pro Val 530 535 540 545	1749
CTA GCC ACC AAC ATC AGC GTG AAC ATA TTT GTC ACT GAT CGC AAT GAC Leu Ala Thr Asn Ile Ser Val Asn Ile Phe Val Thr Asp Arg Asn Asp 550 555 560	1797
AAT GCC CCC CAG GTC CTA TAT CCT CGG CCA GGT GGG AGC TCG GTG GAG Asn Ala Pro Gln Val Leu Tyr Pro Arg Pro Gly Gly Ser Ser Val Glu 565 570 575	1845
ATG CTG CCT CGA GGT ACC TCA GCT GGC CAC CTA GTG TCA CGG GTG GTA Met Leu Pro Arg Gly Thr Ser Ala Gly His Leu Val Ser Arg Val Val 580 585 590	1893
GGC TGG GAC GCG GAT GCA GGG CAC AAT GCC TGG CTC TCC TAC AGT CTC Gly Trp Asp Ala Asp Ala Gly His Asn Ala Trp Leu Ser Tyr Ser Leu 595 600 605	1941
TTT GGA TCC CCT AAC CAG AGC CTT TTT GCC ATA GGG CTG CAC ACT GGT Phe Gly Ser Pro Asn Gln Ser Leu Phe Ala Ile Gly Leu His Thr Gly 610 615 620 625	1989
CAA ATC AGT ACT GCC CGT CCA GTC CAA GAC ACA GAT TCA CCC AGG CAG Gln Ile Ser Thr Ala Arg Pro Val Gln Asp Thr Asp Ser Pro Arg Gln 630 635 640	2037
ACT CTC ACT GTC TTG ATC AAA GAC AAT GGG GAG CCT TCG CTC TCC ACC Thr Leu Thr Val Leu Ile Lys Asp Asn Gly Glu Pro Ser Leu Ser Thr 645 650 655	2085
ACT GCT ACC CTC ACT GTG TCA GTA ACC GAG GAC TCT CCT GAA GCC CGA Thr Ala Thr Leu Thr Val Ser Val Thr Glu Asp Ser Pro Glu Ala Arg 660 665 670	2133
GCC GAG TTC CCC TCT GGC TCT GCC AGT TAAACCTTCT TTAATTATGG Ala Glu Phe Pro Ser Gly Ser Ala Ser 675 680	2180
ATTAGCCATT AACATTTTTG AAACGTGGAC CATTTAACCT CGGCCTACCC CCTCCAAC TG	2240
TCCTGGTGAT GAGTTCATTA GCTAAGTTAA ATTAATTGAA CTTTGATCTA AACCAAAACA	2300
AATCAGGAAA ATAAAGCTGT AAAGGAACTT ATCAAGCATT CCAAAACCAA CTAGAAATTA	2360
CTTGAAGTTT CGAGTGAGCA TTGCCTGTGC CAGTATTCTT CATTATAGGA TTATAAACTC	2420
GTTTTTTTCC CAAAGCGCAT GTCTACGCCA GGCAGAGGAG TAATTATTCA GCCAATTTCA	2480
TGGATGTAAC GATGGATATA AATAATTGAT AGCACCTAGA GGCTTCCAGT TTGGGTGGAA	2540
GGCTAAAGT AGAGGGGAAC TCACTCACTT GAGAAATGAT ATTTAAGTGA ATAAATAGTT	2600
CTCTTCTATG AAAC TATTAC TATTTAGTTC TCTGGAAAAC TTAAGTGTAT TAATGATTAG	2660
AACATCAAAT CCTAAGTAAA GAAATGACAT TTAAATATA AAAAGCCAAA CTTTAAATAA	2720

ATCATAGAGA CCTCAGACAT AATATAGGAA A

2751

## (2) INFORMATION FOR SEQ ID NO:107:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 682 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:107:

```

Met Val Pro Glu Ala Trp Arg Ser Gly Leu Val Ser Thr Gly Arg Val
 1             5             10             15
Val Gly Val Leu Leu Leu Leu Gly Ala Leu Asn Lys Ala Ser Thr Val
      20             25             30
Ile His Tyr Glu Ile Pro Glu Glu Arg Glu Lys Gly Phe Ala Val Gly
      35             40             45
Asn Val Val Ala Asn Leu Gly Leu Asp Leu Gly Ser Leu Ser Ala Arg
      50             55             60
Arg Phe Pro Val Val Ser Gly Ala Ser Arg Arg Phe Phe Glu Val Asn
      65             70             75             80
Arg Glu Thr Gly Glu Met Phe Val Asn Asp Arg Leu Asp Arg Glu Glu
      85             90             95
Leu Cys Gly Thr Leu Pro Ser Cys Thr Val Thr Leu Glu Leu Val Val
      100            105            110
Glu Asn Pro Leu Glu Leu Phe Ser Val Glu Val Val Ile Gln Asp Ile
      115            120            125
Asn Asp Asn Asn Pro Ala Phe Pro Thr Gln Glu Met Lys Leu Glu Ile
      130            135            140
Ser Glu Ala Val Ala Pro Gly Thr Arg Phe Pro Leu Glu Ser Ala His
      145            150            155            160
Asp Pro Asp Leu Gly Ser Asn Ser Leu Gln Thr Tyr Glu Leu Ser Arg
      165            170            175
Asn Glu Tyr Phe Ala Leu Arg Val Gln Thr Arg Glu Asp Ser Thr Lys
      180            185            190
Tyr Ala Glu Leu Val Leu Glu Arg Ala Leu Asp Arg Glu Arg Glu Pro
      195            200            205
Ser Leu Gln Leu Val Leu Thr Ala Leu Asp Gly Gly Thr Pro Ala Leu
      210            215            220
Ser Ala Ser Leu Pro Ile His Ile Lys Val Leu Asp Ala Asn Asp Asn
      225            230            235            240
Ala Pro Val Phe Asn Gln Ser Leu Tyr Arg Ala Arg Val Pro Gly Gly
      245            250            255

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Cys Thr Ser Gly Thr Arg Val Val Gln Val Leu Ala Thr Asp Leu Asp  
 260 265 270  
 Glu Gly Pro Asn Gly Glu Ile Ile Tyr Ser Phe Gly Ser His Asn Arg  
 275 280 285  
 Ala Gly Val Arg Gln Leu Phe Ala Leu Asp Leu Val Thr Gly Met Leu  
 290 295 300  
 Thr Ile Lys Gly Arg Leu Asp Phe Glu Asp Thr Lys Leu His Glu Ile  
 305 310 315 320  
 Tyr Ile Gln Ala Lys Asp Lys Gly Ala Asn Pro Glu Gly Ala His Cys  
 325 330 335  
 Lys Val Leu Val Glu Val Val Asp Val Asn Asp Asn Ala Pro Glu Ile  
 340 345 350  
 Thr Val Thr Ser Val Tyr Ser Pro Val Pro Glu Asp Ala Ser Gly Thr  
 355 360 365  
 Val Ile Ala Leu Leu Ser Val Thr Asp Leu Asp Ala Gly Glu Asn Gly  
 370 375 380  
 Leu Val Thr Cys Glu Val Pro Pro Gly Leu Pro Phe Ser Leu Thr Ser  
 385 390 395 400  
 Ser Leu Lys Asn Tyr Phe Thr Leu Lys Thr Ser Ala Asp Leu Asp Arg  
 405 410 415  
 Glu Thr Val Pro Glu Tyr Asn Leu Ser Ile Thr Ala Arg Asp Ala Gly  
 420 425 430  
 Thr Pro Ser Leu Ser Ala Leu Thr Ile Val Arg Val Gln Val Ser Asp  
 435 440 445  
 Ile Asn Asp Asn Pro Pro Gln Ser Ser Gln Ser Ser Tyr Asp Val Tyr  
 450 455 460  
 Ile Glu Glu Asn Asn Leu Pro Gly Ala Pro Ile Leu Asn Leu Ser Val  
 465 470 475 480  
 Trp Asp Pro Asp Ala Pro Gln Asn Ala Arg Leu Ser Phe Phe Leu Leu  
 485 490 495  
 Glu Gln Gly Ala Glu Thr Gly Leu Val Gly Arg Tyr Phe Thr Ile Asn  
 500 505 510  
 Arg Asp Asn Gly Ile Val Ser Ser Leu Val Pro Leu Asp Tyr Glu Asp  
 515 520 525  
 Arg Arg Glu Phe Glu Leu Thr Ala His Ile Ser Asp Gly Gly Thr Pro  
 530 535 540  
 Val Leu Ala Thr Asn Ile Ser Val Asn Ile Phe Val Thr Asp Arg Asn  
 545 550 555 560  
 Asp Asn Ala Pro Gln Val Leu Tyr Pro Arg Pro Gly Gly Ser Ser Val  
 565 570 575

Glu Met Leu Pro Arg Gly Thr Ser Ala Gly His Leu Val Ser Arg Val  
580 585 590

Val Gly Trp Asp Ala Asp Ala Gly His Asn Ala Trp Leu Ser Tyr Ser  
595 600 605

Leu Phe Gly Ser Pro Asn Gln Ser Leu Phe Ala Ile Gly Leu His Thr  
610 615 620

Gly Gln Ile Ser Thr Ala Arg Pro Val Gln Asp Thr Asp Ser Pro Arg  
625 630 635 640

Gln Thr Leu Thr Val Leu Ile Lys Asp Asn Gly Glu Pro Ser Leu Ser  
645 650 655

Thr Thr Ala Thr Leu Thr Val Ser Val Thr Glu Asp Ser Pro Glu Ala  
660 665 670

Arg Ala Glu Phe Pro Ser Gly Ser Ala Ser  
675 680

(2) INFORMATION FOR SEQ ID NO:108:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 2831 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:108:

GAATTCGGCA CGAGGCTGAA CTGAGGGTGA CGACATAAA CGACTATTCT CCAGTGTTC	60
GTGAAAGAGA AATGATACTG AGGATACCAG AAAACAGTGC TCGGGGAAAT ACATTCCTT	120
TAAACAATGC TCTGGACTCA GACGTAGATA TCAACAATAT CCAGACCTAT AGGCTCAGCT	180
CAAACCTCTCA TTTCCTGGTT GTAACCCGCA ACCGCAGTGA TGGCAGGAAG TACCCAGAGC	240
TGGTGCTGGA GAAAGAACTG GATCGAGAGG AGGAACCTGA GCTGAGGTTA ACGCTGACAG	300
CTTTGGATGG TGGCTCTCCT CCCCGGTCTG GGACGACACA GGTCTCATT GAAGTAGTGG	360
ACACCAACGA TAATGCACCC GAGTTTCAGC AGCCAACATA CCAAGTGCAA ACTCCCGAGA	420
ACAGTCCAC CGGCTCTCTG GTACTCACAG TCTCAGCCAA TGACTTAGAC AGTGGAGACT	480
ATGGGAAAGT CTTGTACGCA CTTTCGCAAC CCTCAGAAGA TATTAGCAAA ACATTCGAGG	540
TAAACCCTGT AACCAGGGGAA ATTCGCCTAC GAAAAGAGGT GAATTTTGAA ACTATTCCTT	600
CGTATGAAGT GGTTATCAAG GGGACGGACG GGGGAGGTCT CTCAGGAAAA TGCCTCTGT	660
TACTGCAGGT GGTGGACGTG AATGACAATG CCCAGAAGT GATGCTATCT GCGCTAACCA	720
ACCCAGTCCC AGAAAATTCC CCCGATGAGG TAGTGGCTGT TTTCAGTGTT AGAGATCCTG	780
ACTCTGGGAA CAACGGAAAA GTGATTGCAT CCATCGAGGA AGACCTGCCC TTTCTTCTAA	840

AATCTTCAGG AAAGAACTTT TACACTTTAG TAACCAAGGG AGCACTTGAC AGGGAAGAAA	900
GAGAGCAATT GAACATCACC ATCACAGTCA CTGACCTGGG CATACCCAGG CTCACCACCC	960
AACACACCAT AACAGTGCAG GTGGCAGACA TCAACGACAA TGCCCCCTCC TTCACCCAAA	1020
CCTCCTACAC CATGTTTGTC CGCGAGAACA ACAGCCCCGC CCTGCACATA GGCACCATCA	1080
GCGCCACAGA CTCAGACTCA GGATCCAATG CCCACATCAC CTACTCGCTG CTACCGCCCC	1140
AAGACCCACA GCTGGCCCTC GACTCGCTCA TCTCCATCAA TGTAGACAAC GGGCAGCTGT	1200
TCGCGCTCAG GCGGCTAGAC TATGAGGCTC TGCAGGGCTT CGAGTTCCAT GTGGGCGCCA	1260
CAGACCAAGG CTCGCCCCGCG CTCAGCAGCC AGGCTCTGGT GCACGTGGTG GTGTTGGACG	1320
ACAATGACAA TGCGCCCTTC GTGCTCTACC CGCTGCAAAA CGCCTCTGCA CCCTTCACTG	1380
AGCTGCTGCC CAGGGCGGCA GAGCCTGGAT ACCTGGTTAC CAAGGTGGTA GCTGTGGACC	1440
GCGACTCTGG CCAGAATGCC TGGCTGTCAT TCCAGCTGCT CAAGGCCACG GAGCCCGGGC	1500
TGTTCAACGT ATGGGCGCAC AATGGCGAGG TACGCACCTC CAGGCTGCTG AGCGAGCGCG	1560
ACGCACCCAA GCACAAGCTG CTGCTGTTGG TCAAGGACAA TGGAGATCCT CCACGCTCTG	1620
CCAGTGTTAC TCTGCACGTG CTAGTGGTGG ATGCCTTCTC TCAGCCCTAC CTGCCTCTGC	1680
CAGAGGTGGC GCACGACCTT GCACAAGAAG AAGATGCGCT AACACTCTAC CTGGTCATAG	1740
CTTTGGCATC TGTGTCTTCT CTCTTCCTCT TGTCTGTGCT GCTGTTCTGTG GGGGTGAGGC	1800
TCTGCAGGAG GGCCAGGGCA GCCTCTCTGA GTGCCTATTC TGTGCCTGAA GGCCACTTTC	1860
CTGGCCAGCT GGTGGATGTC AGAGGTATGG GGACCCTGTC CCAGAGCTAC CAGTATGATG	1920
TATGTCTGAT GGGGGATTCT TCTGGGACCA GCGAATTTAA CTTCTTAAAG CCAGTTCTGC	1980
CTAGCTCTCT GCACCAGTGC TCTGGGAAAG AAATAGAGGA AAATTCCACA CTCCAGAATA	2040
GTTTTGGGTT TCATCATTA TAGAAAACTA CTTTACAGAT ATTTAATTCC AAATATCATC	2100
TTGTTGATTA ACTAAAGTCT GTTCACATGT AGCTAGCTAG CAACGATTTT AATGTTCACT	2160
TTACCCATCT TTTTTCAGGG TCATGTCTAA AGCTACAAGT TTGNCTTTAC TTATACTTGT	2220
CGCACAGAAT NNNNNNNNNN TGGTGTATAA GTCACAGTCA TGGGATACTG GCACAAGATG	2280
GCAGCTTGAT TGCTCAGTTA TGGCTGCAAA GGGGNGCTTG AGTTTAGGGA ATGTGTTAGA	2340
GCTGGAATAA GTTTTCTGAG AAATGTGTAA GACAAATTTT TTTTGCACAT TCCCTGTGTT	2400
CCTGTACCCC TGTTTCCAGA ACTACGAAAT GTGTCATCAG AAGGCATGCT CACATTTTCC	2460
CCTTTGTTTG CGTGACCCGG GTGCCAGAAA TTAAATAAAA TTAGCATGGA GTTCAATGCA	2520
GCATTAAAC AAAGTTACTT CTACAAACCT TTTATTCGAC GGTTAAAATT GTAAC TTCCC	2580
CACCCATGAG GCTGGCTGTA AGAACCAGTA TGAATGGGTG TCTATCGCAA CCTTATTTTC	2640
AAAAATCAAA CAAAAGGAGA AATGAGAGAC CAAACAACAC GCTACAGGAA AGATTTTCATA	2700



AGGATGTATG TATGGACACA AAAACTGGGA TACAGACATT TTAAATCTGT TGGTACCACA 2760  
 TGGTGGCGCT GCAGGCTAAA GAAATGCAAG GGAAATTAAA AAGAGGCTGA GCTAGAAGTC 2820  
 AAAAAAAAAA A 2831

(2) INFORMATION FOR SEQ ID NO:109:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 3353 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

- (ix) FEATURE:  
 (A) NAME/KEY: CDS  
 (B) LOCATION: 763..3123

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:109:

GTATTTTCC ACAGTTTAAA ATTTTCATAA AATCATAACT CTCTGACTTT ATGTAGAAAG 60  
 GATACCACAC TGAATTAAC GTGTAGCTTT TTCTTGATGT AATCCAACCA ATGGGAGCAC 120  
 AATTCTGGTA CATAGGCTGT CTAGAAATTG AAAGAAATTA AAGAATTCAT TTTGTTTTGC 180  
 TGATAAATTT TTAAGAAATC ACGTGGCTTT ATGTTATTAT TATTACAAGA TGA CTGATCA 240  
 CTATTATGTC TTCTTTCACT TCTCAATTC CCTCAGAACA CTACACCCAG ACTACAGGCT 300  
 CTGGAGGGTG GGGACCATGT CTGGGTGTGT TACTGATGTA TTTCATAATT TGGCACATAG 360  
 AGACCAATAA TACTCCTTTA AATGAAGAAA TTAATAATTA CCATTGCGTG ATATTGTGAT 420  
 TACATCATTT CCTCCCAATT TCCAACTCC TAATAGAATA GAGAATAGAT CAATTGTAGC 480  
 AATTCGTTTC GAAGCAAAGA CAACGCATGG TGGCGCTGCA GGCTAAGGCT TCAAAAAAAG 540  
 GAAAAGGAAA AAGCCCATGA AATGCTACTA GCTACTTCAG ACCTCTTTCA GCCTAAGAGG 600  
 AAAGCCTGTT AGCAGAGCAC GGACAGTGT CTCCGGAGAA TGCTATTCTC CTACATTTCC 660  
 GAACAGGTTA TCAACGCACA GATCGATCAC TGCCTCTGTC CCATCGCTCC CTGAAGTAGC 720  
 TCTGACTCCG GTTCCTTGAA AGGGGCGTGT ACAGAAGTAA AG ATG GAG CCT GCA 774  
 Met Glu Pro Ala  
 1  
 GGG GAG CGC TTT CCC GAA CAA AGG CAA GTC CTG ATT CTC CTT CTT TTA 822  
 Gly Glu Arg Phe Pro Glu Gln Arg Gln Val Leu Ile Leu Leu Leu Leu  
 5 10 15 20  
 CTG GAA GTG ACT CTG GCA GGC TGG GAA CCC CGT CGC TAT TCT GTG ATG 870  
 Leu Glu Val Thr Leu Ala Gly Trp Glu Pro Arg Arg Tyr Ser Val Met  
 25 30 35

GAG GAA ACA GAG AGA GGT TCT TTT GTA GCC AAC CTG GCC AAT GAC CTA Glu Glu Thr Glu Arg Gly Ser Phe Val Ala Asn Leu Ala Asn Asp Leu 40 45 50	918
GGG CTG GGA GTG GGG GAG CTA GCC GAG CGG GGA GCC CGG GTA GTT TCT Gly Leu Gly Val Gly Glu Leu Ala Glu Arg Gly Ala Arg Val Val Ser 55 60 65	966
GAG GAT AAC GAA CAA GGC TTG CAG CTT GAT CTG CAG ACC GGG CAG TTG Glu Asp Asn Glu Gln Gly Leu Gln Leu Asp Leu Gln Thr Gly Gln Leu 70 75 80	1014
ATA TTA AAT GAG AAG CTG GAC CGG GAG AAG CTG TGT GGC CCT ACT GAG Ile Leu Asn Glu Lys Leu Asp Arg Glu Lys Leu Cys Gly Pro Thr Glu 85 90 95 100	1062
CCC TGT ATA ATG CAT TTC CAA GTG TTA CTG AAA AAA CCT TTG GAA GTA Pro Cys Ile Met His Phe Gln Val Leu Leu Lys Lys Pro Leu Glu Val 105 110 115	1110
TTT CGA GCT GAA CTA CTA GTG ACA GAC ATA AAC GAT CAT TCT CCT GAG Phe Arg Ala Glu Leu Leu Val Thr Asp Ile Asn Asp His Ser Pro Glu 120 125 130	1158
TTT CCT GAA AGA GAA ATG ACC CTG AAA ATC CCA GAA ACT AGC TCC CTT Phe Pro Glu Arg Glu Met Thr Leu Lys Ile Pro Glu Thr Ser Ser Leu 135 140 145	1206
GGG ACT GTG TTT CCT CTG AAA AAA GCT CGG GAC TTG GAC GTG GGC AGC Gly Thr Val Phe Pro Leu Lys Lys Ala Arg Asp Leu Asp Val Gly Ser 150 155 160	1254
AAT AAT GTT CAA AAC TAC AAT ATT TCT CCC AAT TCT CAT TTC CAT GTT Asn Asn Val Gln Asn Tyr Asn Ile Ser Pro Asn Ser His Phe His Val 165 170 175 180	1302
TCC ACT CGC ACC CGA GGG GAT GGC AGG AAA TAC CCA GAG CTG GTG CTG Ser Thr Arg Thr Arg Gly Asp Gly Arg Lys Tyr Pro Glu Leu Val Leu 185 190 195	1350
GAC ACA GAA CTG GAT CGC GAG GAG CAG GCC GAG CTC AGA TTA ACC TTG Asp Thr Glu Leu Asp Arg Glu Glu Gln Ala Glu Leu Arg Leu Thr Leu 200 205 210	1398
ACA GCG GTG GAC GGT GGC TCT CCA CCC CGA TCT GGC ACC GTC CAG ATC Thr Ala Val Asp Gly Gly Ser Pro Pro Arg Ser Gly Thr Val Gln Ile 215 220 225	1446
CTC ATC TTG GTC TTG GAC GCC AAT GAC AAT GCC CCG GAG TTT GTG CAG Leu Ile Leu Val Leu Asp Ala Asn Asp Asn Ala Pro Glu Phe Val Gln 230 235 240	1494
GCG CTC TAC GAG GTG CAG GTC CCA GAG AAC AGC CCA GTA GGC TCC CTA Ala Leu Tyr Glu Val Gln Val Pro Glu Asn Ser Pro Val Gly Ser Leu 245 250 255 260	1542
GTT GTC AAG GTC TCT GCT AGG GAT TTA GAC ACT GGG ACA AAT GGA GAG Val Val Lys Val Ser Ala Arg Asp Leu Asp Thr Gly Thr Asn Gly Glu 265 270 275	1590

ATA TCA TAC TCC CTT TAT TAC AGC TCT CAG GAG ATA GAC AAA CCT TTT Ile Ser Tyr Ser Leu Tyr Tyr Ser Ser Gln Glu Ile Asp Lys Pro Phe 280 285 290	1638
GAG CTA AGC AGC CTT TCA GGA GAA ATT CGA CTA ATT AAA AAA CTA GAT Glu Leu Ser Ser Leu Ser Gly Glu Ile Arg Leu Ile Lys Lys Leu Asp 295 300 305	1686
TTT GAG ACA ATG TCT TCA TAT GAT CTA GAT ATA GAG GCA TCT GAT GGC Phe Glu Thr Met Ser Ser Tyr Asp Leu Asp Ile Glu Ala Ser Asp Gly 310 315 320	1734
GGG GGA CTT TCT GGA AAA TGC TCT GTC TCT GTT AAG GTG CTG GAT GTT Gly Gly Leu Ser Gly Lys Cys Ser Val Ser Val Lys Val Leu Asp Val 325 330 335 340	1782
AAC GAT AAC TTC CCG GAA CTA AGT ATT TCA TCA CTT ACC AGC CCT ATT Asn Asp Asn Phe Pro Glu Leu Ser Ile Ser Ser Leu Thr Ser Pro Ile 345 350 355	1830
CCC GAG AAT TCT CCA GAG ACA GAA GTG GCC CTG TTT AGG ATT AGA GAC Pro Glu Asn Ser Pro Glu Thr Glu Val Ala Leu Phe Arg Ile Arg Asp 360 365 370	1878
CGA GAC TCT GGA GAA AAT GGA AAA ATG ATT TGC TCA ATT CAG GAT GAT Arg Asp Ser Gly Glu Asn Gly Lys Met Ile Cys Ser Ile Gln Asp Asp 375 380 385	1926
GTT CCT TTT AAG CTA AAA CCT TCT GTT GAG AAT TTC TAC AGG CTG GTA Val Pro Phe Lys Leu Lys Pro Ser Val Glu Asn Phe Tyr Arg Leu Val 390 395 400	1974
ACA GAA GGG GCG CTG GAC AGA GAG ACC AGA GCC GAG TAC AAC ATC ACC Thr Glu Gly Ala Leu Asp Arg Glu Thr Arg Ala Glu Tyr Asn Ile Thr 405 410 415 420	2022
ATC ACC ATC ACA GAC TTG GGG ACT CCA AGG CTG AAA ACC GAG CAG AGC Ile Thr Ile Thr Asp Leu Gly Thr Pro Arg Leu Lys Thr Glu Gln Ser 425 430 435	2070
ATA ACC GTG CTG GTG TCG GAC GTC AAT GAC AAC GCC CCC GCC TTC ACC Ile Thr Val Leu Val Ser Asp Val Asn Asp Asn Ala Pro Ala Phe Thr 440 445 450	2118
CAA ACC TCC TAC ACC CTG TTC GTC CGC GAG AAC AAC AGC CCC GCC CTG Gln Thr Ser Tyr Thr Leu Phe Val Arg Glu Asn Asn Ser Pro Ala Leu 455 460 465	2166
CAC ATC GGC AGT GTC AGC GCC ACA GAC AGA GAC TCG GGC ACC AAC GCC His Ile Gly Ser Val Ser Ala Thr Asp Arg Asp Ser Gly Thr Asn Ala 470 475 480	2214
CAG GTC ACC TAC TCG CTG CTG CCG CCC CAG GAC CCG CAC CTG CCC CTA Gln Val Thr Tyr Ser Leu Leu Pro Pro Gln Asp Pro His Leu Pro Leu 485 490 495 500	2262
ACC TCC CTG GTC TCC ATT AAC ACG GAC AAC GGC CAC CTG TTC GCT CTC Thr Ser Leu Val Ser Ile Asn Thr Asp Asn Gly His Leu Phe Ala Leu 505 510 515	2310

CAG TCG CTG GAC TAC GAG GCC CTG CAG GCT TTC GAG TTC CGC GTG GGC Gln Ser Leu Asp Tyr Glu Ala Leu Gln Ala Phe Glu Phe Arg Val Gly 520 525 530	2358
GCC ACA GAC CGC GGC TTC CCG GCG CTG AGC AGC GAG GCG CTG GTG CGA Ala Thr Asp Arg Gly Phe Pro Ala Leu Ser Ser Glu Ala Leu Val Arg 535 540 545	2406
GTG CTG GTG CTG GAC GCC AAC GAC AAC TCG CCC TTC GTG CTG TAC CCG Val Leu Val Leu Asp Ala Asn Asp Asn Ser Pro Phe Val Leu Tyr Pro 550 555 560	2454
CTG CAG AAC GGC TCC GCG CCC TGC ACC GAG CTG GTG CCC CGG GCG GCC Leu Gln Asn Gly Ser Ala Pro Cys Thr Glu Leu Val Pro Arg Ala Ala 565 570 575 580	2502
GAG CCG GGC TAC CTG GTG ACC AAG GTG GTG GCG GTG GAC GGC GAC TCG Glu Pro Gly Tyr Leu Val Thr Lys Val Val Ala Val Asp Gly Asp Ser 585 590 595	2550
GGC CAG AAC GCC TGG CTG TCG TAC CAG CTG CTC AAG GCC ACG GAG CCC Gly Gln Asn Ala Trp Leu Ser Tyr Gln Leu Leu Lys Ala Thr Glu Pro 600 605 610	2598
GGG CTG TTC GGC GTG TGG GCG CAC AAT GGC GAG GTG CGC ACC GCC AGG Gly Leu Phe Gly Val Trp Ala His Asn Gly Glu Val Arg Thr Ala Arg 615 620 625	2646
CTG CTG AGC GAG CGC GAC GTG GCC AAG CAC AGG CTA GTG GTG CTG GTC Leu Leu Ser Glu Arg Asp Val Ala Lys His Arg Leu Val Val Leu Val 630 635 640	2694
AAG GAC AAT GGC GAG CCT CCG CGC TCG GCC ACA GCC ACG CTG CAA GTG Lys Asp Asn Gly Glu Pro Pro Arg Ser Ala Thr Ala Thr Leu Gln Val 645 650 655 660	2742
CTC CTG GTG GAC GGC TTC TCT CAG CCC TAC CTG CCG CTC CCA GAG GCG Leu Leu Val Asp Gly Phe Ser Gln Pro Tyr Leu Pro Leu Pro Glu Ala 665 670 675	2790
GCC CCG GCC CAA GCC CAG GCC GAC TCG CTT ACC GTC TAC CTG GTG GTG Ala Pro Ala Gln Ala Gln Ala Asp Ser Leu Thr Val Tyr Leu Val Val 680 685 690	2838
GCA TTG GCC TCG GTG TCT TCG CTC TTC CTC TTC TCG GTG TTC CTG TTC Ala Leu Ala Ser Val Ser Ser Leu Phe Leu Phe Ser Val Phe Leu Phe 695 700 705	2886
GTG GCA GTG CGG CTG TGC AGG AGG AGC AGG GCG GCC TCA GTG GGT CGC Val Ala Val Arg Leu Cys Arg Arg Ser Arg Ala Ala Ser Val Gly Arg 710 715 720	2934
TGC TCG GTG CCC GAG GGC CCC TTT CCA GGG CAT CTG GTG GAC GTG AGC Cys Ser Val Pro Glu Gly Pro Phe Pro Gly His Leu Val Asp Val Ser 725 730 735 740	2982
GGC ACC GGG ACC CTT TCC CAG AGC TAC CAG TAC GAG GTG TGT CTG ACG Gly Thr Gly Thr Leu Ser Gln Ser Tyr Gln Tyr Glu Val Cys Leu Thr 745 750 755	3030

GGA GGC TCT GAA AGT AAT GAT TTC AAG TTC TTG AAG CCT ATA TTC CCA 3078  
 Gly Gly Ser Glu Ser Asn Asp Phe Lys Phe Leu Lys Pro Ile Phe Pro  
                   760                  765                  770

AAT ATT GTA AGC CAG GAC TCT AGG AGG AAA TCA GAA TTT CTA GAA 3123  
 Asn Ile Val Ser Gln Asp Ser Arg Arg Lys Ser Glu Phe Leu Glu  
                   775                  780                  785

TAATGTAGGT ATCTGTAGCT TTCCGACCGT CTGTTAATTT TGTCTTCCTC ACTTTTCACC 3183

TTAGTTTTTTT TTAACCCTTT AGTAATCTTG AATTCTACTT TTTTTTAAAT TTCTACTGTT 3243

GTCTTTAGTA ATGTTACTCA TTTCTTTTGT CTGATTGTTA GTTTTCAAAT TATTGTATTA 3303

TTATAAATAT TTTATATCAG GAAAGTTCAT ATTTCTGAAT AAATTAATAG 3353

## (2) INFORMATION FOR SEQ ID NO:110:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 787 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:110:

Met Glu Pro Ala Gly Glu Arg Phe Pro Glu Gln Arg Gln Val Leu Ile  
   1                  5                  10                  15

Leu Leu Leu Leu Leu Glu Val Thr Leu Ala Gly Trp Glu Pro Arg Arg  
                   20                  25                  30

Tyr Ser Val Met Glu Glu Thr Glu Arg Gly Ser Phe Val Ala Asn Leu  
                   35                  40                  45

Ala Asn Asp Leu Gly Leu Gly Val Gly Glu Leu Ala Glu Arg Gly Ala  
                   50                  55                  60

Arg Val Val Ser Glu Asp Asn Glu Gln Gly Leu Gln Leu Asp Leu Gln  
                   65                  70                  75                  80

Thr Gly Gln Leu Ile Leu Asn Glu Lys Leu Asp Arg Glu Lys Leu Cys  
                   85                  90                  95

Gly Pro Thr Glu Pro Cys Ile Met His Phe Gln Val Leu Leu Lys Lys  
                   100                  105                  110

Pro Leu Glu Val Phe Arg Ala Glu Leu Leu Val Thr Asp Ile Asn Asp  
                   115                  120                  125

His Ser Pro Glu Phe Pro Glu Arg Glu Met Thr Leu Lys Ile Pro Glu  
                   130                  135                  140

Thr Ser Ser Leu Gly Thr Val Phe Pro Leu Lys Lys Ala Arg Asp Leu  
                   145                  150                  155                  160

Asp Val Gly Ser Asn Asn Val Gln Asn Tyr Asn Ile Ser Pro Asn Ser  
                   165                  170                  175

His Phe His Val Ser Thr Arg Thr Arg Gly Asp Gly Arg Lys Tyr Pro  
 180 185 190  
 Glu Leu Val Leu Asp Thr Glu Leu Asp Arg Glu Glu Gln Ala Glu Leu  
 195 200 205  
 Arg Leu Thr Leu Thr Ala Val Asp Gly Gly Ser Pro Pro Arg Ser Gly  
 210 215 220  
 Thr Val Gln Ile Leu Ile Leu Val Leu Asp Ala Asn Asp Asn Ala Pro  
 225 230 235 240  
 Glu Phe Val Gln Ala Leu Tyr Glu Val Gln Val Pro Glu Asn Ser Pro  
 245 250 255  
 Val Gly Ser Leu Val Val Lys Val Ser Ala Arg Asp Leu Asp Thr Gly  
 260 265 270  
 Thr Asn Gly Glu Ile Ser Tyr Ser Leu Tyr Tyr Ser Ser Gln Glu Ile  
 275 280 285  
 Asp Lys Pro Phe Glu Leu Ser Ser Leu Ser Gly Glu Ile Arg Leu Ile  
 290 295 300  
 Lys Lys Leu Asp Phe Glu Thr Met Ser Ser Tyr Asp Leu Asp Ile Glu  
 305 310 315 320  
 Ala Ser Asp Gly Gly Gly Leu Ser Gly Lys Cys Ser Val Ser Val Lys  
 325 330 335  
 Val Leu Asp Val Asn Asp Asn Phe Pro Glu Leu Ser Ile Ser Ser Leu  
 340 345 350  
 Thr Ser Pro Ile Pro Glu Asn Ser Pro Glu Thr Glu Val Ala Leu Phe  
 355 360 365  
 Arg Ile Arg Asp Arg Asp Ser Gly Glu Asn Gly Lys Met Ile Cys Ser  
 370 375 380  
 Ile Gln Asp Asp Val Pro Phe Lys Leu Lys Pro Ser Val Glu Asn Phe  
 385 390 395 400  
 Tyr Arg Leu Val Thr Glu Gly Ala Leu Asp Arg Glu Thr Arg Ala Glu  
 405 410 415  
 Tyr Asn Ile Thr Ile Thr Ile Thr Asp Leu Gly Thr Pro Arg Leu Lys  
 420 425 430  
 Thr Glu Gln Ser Ile Thr Val Leu Val Ser Asp Val Asn Asp Asn Ala  
 435 440 445  
 Pro Ala Phe Thr Gln Thr Ser Tyr Thr Leu Phe Val Arg Glu Asn Asn  
 450 455 460  
 Ser Pro Ala Leu His Ile Gly Ser Val Ser Ala Thr Asp Arg Asp Ser  
 465 470 475 480  
 Gly Thr Asn Ala Gln Val Thr Tyr Ser Leu Leu Pro Pro Gln Asp Pro  
 485 490 495

His Leu Pro Leu Thr Ser Leu Val Ser Ile Asn Thr Asp Asn Gly His  
 500 505 510  
 Leu Phe Ala Leu Gln Ser Leu Asp Tyr Glu Ala Leu Gln Ala Phe Glu  
 515 520 525  
 Phe Arg Val Gly Ala Thr Asp Arg Gly Phe Pro Ala Leu Ser Ser Glu  
 530 535 540  
 Ala Leu Val Arg Val Leu Val Leu Asp Ala Asn Asp Asn Ser Pro Phe  
 545 550 555 560  
 Val Leu Tyr Pro Leu Gln Asn Gly Ser Ala Pro Cys Thr Glu Leu Val  
 565 570 575  
 Pro Arg Ala Ala Glu Pro Gly Tyr Leu Val Thr Lys Val Val Ala Val  
 580 585 590  
 Asp Gly Asp Ser Gly Gln Asn Ala Trp Leu Ser Tyr Gln Leu Leu Lys  
 595 600 605  
 Ala Thr Glu Pro Gly Leu Phe Gly Val Trp Ala His Asn Gly Glu Val  
 610 615 620  
 Arg Thr Ala Arg Leu Leu Ser Glu Arg Asp Val Ala Lys His Arg Leu  
 625 630 635 640  
 Val Val Leu Val Lys Asp Asn Gly Glu Pro Pro Arg Ser Ala Thr Ala  
 645 650 655  
 Thr Leu Gln Val Leu Leu Val Asp Gly Phe Ser Gln Pro Tyr Leu Pro  
 660 665 670  
 Leu Pro Glu Ala Ala Pro Ala Gln Ala Gln Ala Asp Ser Leu Thr Val  
 675 680 685  
 Tyr Leu Val Val Ala Leu Ala Ser Val Ser Ser Leu Phe Leu Phe Ser  
 690 695 700  
 Val Phe Leu Phe Val Ala Val Arg Leu Cys Arg Arg Ser Arg Ala Ala  
 705 710 715 720  
 Ser Val Gly Arg Cys Ser Val Pro Glu Gly Pro Phe Pro Gly His Leu  
 725 730 735  
 Val Asp Val Ser Gly Thr Gly Thr Leu Ser Gln Ser Tyr Gln Tyr Glu  
 740 745 750  
 Val Cys Leu Thr Gly Gly Ser Glu Ser Asn Asp Phe Lys Phe Leu Lys  
 755 760 765  
 Pro Ile Phe Pro Asn Ile Val Ser Gln Asp Ser Arg Arg Lys Ser Glu  
 770 775 780  
 Phe Leu Glu  
 785

## (2) INFORMATION FOR SEQ ID NO:111:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 3033 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: cDNA

## (ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 138..2528

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:111:

GTGATTGGAC GTGTTTTTGT GACTATTTGG GAAGAAGACA CCTTCCTAAT CAGATTTACT	60
CCAATATCTT CCCGGACCCT CATGAGTGGG TTGCAATTGA CTTGAAGAAG CAGCACCCTC	120
AGGACTGAAT CTGAACA ATG GAG ACA GCA CTA GCA AAA ATA CCA CAG CAA	170
Met Glu Thr Ala Leu Ala Lys Ile Pro Gln Gln	
1 5 10	
AGG CAA GTC TTT TTT CTT ACT ATA TTG TCG TTA TTG TGG AAG TCT AGC	218
Arg Gln Val Phe Phe Leu Thr Ile Leu Ser Leu Leu Trp Lys Ser Ser	
15 20 25	
TCT GAG GCC ATT AGA TAT TCC ATG CCA GAA GAA ACA GAG AGT GGC TAT	266
Ser Glu Ala Ile Arg Tyr Ser Met Pro Glu Glu Thr Glu Ser Gly Tyr	
30 35 40	
ATG GTG GCT AAC CTG GCG AAA GAT CTG GGG ATC AGG GTT GGA GAA CTG	314
Met Val Ala Asn Leu Ala Lys Asp Leu Gly Ile Arg Val Gly Glu Leu	
45 50 55	
TCC TCT AGA GGA GCT CAA ATC CAT TAC AAA GGA AAC AAA GAA CTT TTG	362
Ser Ser Arg Gly Ala Gln Ile His Tyr Lys Gly Asn Lys Glu Leu Leu	
60 65 70 75	
CAG CTG GAT GCA GAG ACT GGG AAT TTG TTC TTA AAG GAA AAA CTA GAC	410
Gln Leu Asp Ala Glu Thr Gly Asn Leu Phe Leu Lys Glu Lys Leu Asp	
80 85 90	
AGA GAA CTG CTG TGT GGA GAG ACA GAA CCC TGT GTG CTG AAC TTC CAG	458
Arg Glu Leu Leu Cys Gly Glu Thr Glu Pro Cys Val Leu Asn Phe Gln	
95 100 105	
ATC ATA CTG GAA AAC CCT ATG CAG TTC TTC CAA ACT GAA CTG CAG CTC	506
Ile Ile Leu Glu Asn Pro Met Gln Phe Phe Gln Thr Glu Leu Gln Leu	
110 115 120	
ACA GAT ATA AAC GAC CAT TCT CCA GAG TTC CCC AAC AAG AAA ATG CTT	554
Thr Asp Ile Asn Asp His Ser Pro Glu Phe Pro Asn Lys Lys Met Leu	
125 130 135	
CTA ACA ATT CCT GAG AGT GCC CAT CCA GGG ACT GTG TTT CCT CTG AAG	602
Leu Thr Ile Pro Glu Ser Ala His Pro Gly Thr Val Phe Pro Leu Lys	
140 145 150 155	



GCA GCT CGG GAC TCT GAC ATA GGG AGC AAC GCT GTT CAG AAC TAC ACA Ala Ala Arg Asp Ser Asp Ile Gly Ser Asn Ala Val Gln Asn Tyr Thr 160 165 170	650
GTC AAT CCC AAC CTC CAT TTC CAC GTC GTT ACT CAC AGT CGC ACA GAT Val Asn Pro Asn Leu His Phe His Val Val Thr His Ser Arg Thr Asp 175 180 185	698
GGC AGG AAA TAC CCA GAG CTG GTG CTG GAC AGA GCC CTG GAT AGG GAG Gly Arg Lys Tyr Pro Glu Leu Val Leu Asp Arg Ala Leu Asp Arg Glu 190 195 200	746
GAG CAG CCT GAG CTC ACT TTA ATC CTC ACT GCT CTG GAT GGT GGA GCT Glu Gln Pro Glu Leu Thr Leu Ile Leu Thr Ala Leu Asp Gly Gly Ala 205 210 215	794
CCT TCC AGG TCA GGA ACC ACC ACA GTT CAC ATA GAA GTT GTG GAC ATC Pro Ser Arg Ser Gly Thr Thr Val His Ile Glu Val Val Asp Ile 220 225 230 235	842
AAT GAT AAC TCC CCC CAG TTT GTA CAG TCA CTC TAT AAG GTG CAA GTT Asn Asp Asn Ser Pro Gln Phe Val Gln Ser Leu Tyr Lys Val Gln Val 240 245 250	890
CCT GAG AAT AAT CCC CTC AAT GCC TTT GTT GTC ACG GTC TCT GCC ACG Pro Glu Asn Asn Pro Leu Asn Ala Phe Val Val Thr Val Ser Ala Thr 255 260 265	938
GAT TTA GAT GCT GGG GTA TAT GGC AAT GTG ACC TAT TCT CTG TTT CAA Asp Leu Asp Ala Gly Val Tyr Gly Asn Val Thr Tyr Ser Leu Phe Gln 270 275 280	986
GGG TAT GGG GTA TTT CAA CCA TTT GTA ATA GAC GAA ATC ACT GGA GAA Gly Tyr Gly Val Phe Gln Pro Phe Val Ile Asp Glu Ile Thr Gly Glu 285 290 295	1034
ATC CAT CTG AGC AAA GAG CTG GAT TTT GAG GAA ATT AGC AAT CAT AAC Ile His Leu Ser Lys Glu Leu Asp Phe Glu Glu Ile Ser Asn His Asn 300 305 310 315	1082
ATA GAA ATC GCA GCC ACA GAT GGA GGA GGC CTT TCA GGA AAA TGC ACT Ile Glu Ile Ala Ala Thr Asp Gly Gly Glu Leu Ser Gly Lys Cys Thr 320 325 330	1130
GTG GCT GTA CAG GTG TTG GAT GTG AAT GAC AAC GCC CCA GAG TTG ACA Val Ala Val Gln Val Leu Asp Val Asn Asp Asn Ala Pro Glu Leu Thr 335 340 345	1178
ATT AGG AAG CTC ACA GTC CTG GTC CCA GAA AAT TCC GCA GAG ACT GTA Ile Arg Lys Leu Thr Val Leu Val Pro Glu Asn Ser Ala Glu Thr Val 350 355 360	1226
GTT GCT GTT TTT AGT GTT TCT GAT TCT GAT TCG GGG GAC AAT GGA AGG Val Ala Val Phe Ser Val Ser Asp Ser Asp Ser Gly Asp Asn Gly Arg 365 370 375	1274
ATG GTG TGT TCT ATT CCG AAC AAT ATC CCA TTT CTC CTG AAA CCC ACA Met Val Cys Ser Ile Pro Asn Asn Ile Pro Phe Leu Leu Lys Pro Thr 380 385 390 395	1322

TTT GAG AAT TAT TAC ACG TTA GTG ACT GAG GGG CCA CTT GAT AGA GAG Phe Glu Asn Tyr Tyr Thr Leu Val Thr Glu Gly Pro Leu Asp Arg Glu 400 405 410	1370
AAC AGA GCT GAG TAC AAC ATC ACC ATC ACG GTC TCA GAT CTG GGC ACA Asn Arg Ala Glu Tyr Asn Ile Thr Ile Thr Val Ser Asp Leu Gly Thr 415 420 425	1418
CCC AGG CTC ACA ACC CAG CAC ACC ATA ACA GTG CAA GTG TCC GAC ATC Pro Arg Leu Thr Thr Gln His Thr Ile Thr Val Gln Val Ser Asp Ile 430 435 440	1466
AAC GAC AAC GCC CCT GCC TTC ACC CAA ACC TCC TAC ACC ATG TTT GTC Asn Asp Asn Ala Pro Ala Phe Thr Gln Thr Ser Tyr Thr Met Phe Val 445 450 455	1514
CAC GAG AAC AAC AGC CCC GCC CTG CAC ATA GGC ACC ATC AGT GCC ACA His Glu Asn Asn Ser Pro Ala Leu His Ile Gly Thr Ile Ser Ala Thr 460 465 470 475	1562
GAC TCA GAC TCA GGC TCC AAT GCC CAC ATC ACC TAC TCG CTG CTG CCG Asp Ser Asp Ser Gly Ser Asn Ala His Ile Thr Tyr Ser Leu Leu Pro 480 485 490	1610
CCT GAT GAC CCG CAG CTG GCC CTC GAC TCA CTC ATC TCC ATC AAT GTT Pro Asp Asp Pro Gln Leu Ala Leu Asp Ser Leu Ile Ser Ile Asn Val 495 500 505	1658
GAC AAT GGG CAG CTG TTC GCG CTC AGA GCT CTA GAC TAT GAG GCA CTG Asp Asn Gly Gln Leu Phe Ala Leu Arg Ala Leu Asp Tyr Glu Ala Leu 510 515 520	1706
CAG TCC TTC GAG TTC TAC GTG GGC GCT ACA GAT GGA GGC TCA CCC GCG Gln Ser Phe Glu Phe Tyr Val Gly Ala Thr Asp Gly Gly Ser Pro Ala 525 530 535	1754
CTC AGC AGC CAG ACT CTG GTG CGG ATG GTG GTG CTG GAT GAC AAT GAC Leu Ser Ser Gln Thr Leu Val Arg Met Val Val Leu Asp Asp Asn Asp 540 545 550 555	1802
AAT GCC CCC TTC GTG CTC TAC CCA CTG CAG AAT GCC TCA GCA CCC TGT Asn Ala Pro Phe Val Leu Tyr Pro Leu Gln Asn Ala Ser Ala Pro Cys 560 565 570	1850
ACT GAG CTA CTG CCT AGG GCA GCA GAG CCC GGC TAC CTG ATC ACC AAA Thr Glu Leu Leu Pro Arg Ala Ala Glu Pro Gly Tyr Leu Ile Thr Lys 575 580 585	1898
GTG GTG GCT GTG GAT CGC GAC TCT GGA CAG AAT GCT TGG CTG TCG TTC Val Val Ala Val Asp Arg Asp Ser Gly Gln Asn Ala Trp Leu Ser Phe 590 595 600	1946
CAG CTA CTT AAA GCT ACA GAG CCA GGG CTG TTC AGT GTA TGG GCA CAC Gln Leu Leu Lys Ala Thr Glu Pro Gly Leu Phe Ser Val Trp Ala His 605 610 615	1994
AAT GGT GAA GTG CGC ACC ACT AGG CTG CTG AGT GAG CGA GAT GCT CAG Asn Gly Glu Val Arg Thr Thr Arg Leu Leu Ser Glu Arg Asp Ala Gln 620 625 630 635	2042

AAG CAC AAG CTA CTG CTG CTG GTC AAG GAC AAT GGC GAT CCT CTG CGC Lys His Lys Leu Leu Leu Leu Val Lys Asp Asn Gly Asp Pro Leu Arg 640 645 650	2090
TCT GCC AAT GTC ACT CTT CAC GTG CTA GTG GTG GAT GGC TTC TCG CAG Ser Ala Asn Val Thr Leu His Val Leu Val Val Asp Gly Phe Ser Gln 655 660 665	2138
CCT TAC CTA CCA TTG GCT GAG GTG GCA CAG GAT TCC ATG CAA GAT AAT Pro Tyr Leu Pro Leu Ala Glu Val Ala Gln Asp Ser Met Gln Asp Asn 670 675 680	2186
TAC GAC GTT CTC ACA CTG TAC CTA GTC ATT GCC TTG GCA TCT GTA TCT Tyr Asp Val Leu Thr Leu Tyr Leu Val Ile Ala Leu Ala Ser Val Ser 685 690 695	2234
TCT CTC TTC CTC TTG TCT GTA GTG CTG TTT GTG GGG GTG AGG CTG TGC Ser Leu Phe Leu Leu Ser Val Val Leu Phe Val Gly Val Arg Leu Cys 700 705 710 715	2282
AGG AGG GCC AGG GAG GCC TCC TTG GGT GAC TAC TCT GTG CCT GAG GGA Arg Arg Ala Arg Glu Ala Ser Leu Gly Asp Tyr Ser Val Pro Glu Gly 720 725 730	2330
CAC TTT CCT AGC CAC TTG GTG GAT GTC AGC GGT GCC GGG ACC CTG TCC His Phe Pro Ser His Leu Val Asp Val Ser Gly Ala Gly Thr Leu Ser 735 740 745	2378
CAG AGT TAT CAA TAT GAG GTG TGT CTT AAT GGA GGT ACT AGA ACA AAT Gln Ser Tyr Gln Tyr Glu Val Cys Leu Asn Gly Gly Thr Arg Thr Asn 750 755 760	2426
GAG TTT AAC TTT CTT AAA CCA TTG TTT CCT ATC CTT CCG ACC CAG GCT Glu Phe Asn Phe Leu Lys Pro Leu Phe Pro Ile Leu Pro Thr Gln Ala 765 770 775	2474
GCT GCT GCT GAA GAA AGA GAA AAC GCT GTT GTG CAC AAT AGC GTT GGA Ala Ala Ala Glu Glu Arg Glu Asn Ala Val Val His Asn Ser Val Gly 780 785 790 795	2522
TTC TAT TAGAGCACTG ATTTTGAAGT GGTGGTTACC TCATTTTCC TTAACATCC Phe Tyr	2578
CTGATGTAGA ATGGTGTAGT GCCGTGAATC AACTCCTGAG ATATATGTTC ATTTTATCCT	2638
TTGTTTTGAA TCAAATATT CAGATGTGAT CCTACTCTAG AGAATTTGGT TCTACTCCAT	2698
TGTGTTTGTGTT TAGATTTCTA CGCCATACCA GTGCATGCTG GGTTGTTTTT TTTTTTACAA	2758
TTATTATAAC TTTGCTTTGG AGGGGAACTC ATATTGCTG TAACGAATTG GAACCACTTT	2818
CATTGTTAGA GATGCCTTGC TTTGTTGTGT TATTTTCTAG AGGGTCTTAA ATTGTAGCCC	2878
TGGGTGACCT GAAATGACTA TGTACAGACT GACTTTGAAT TTGTGGCAGT CCATCTGCCT	2938
CTGTTGTCCT ATGTTGGGAT TGTGAGCATG CATGAGTAGG CTCAGCTGTG GTGAGCGACC	2998
TTAATAAAAA TCAAATACTA AAAAAAAAAA AAAAA	3033

## (2) INFORMATION FOR SEQ ID NO:112:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 797 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: protein

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:112:

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Met Glu Thr Ala Leu Ala Lys Ile Pro Gln Gln Arg Gln Val Phe Phe
 1             5             10             15
Leu Thr Ile Leu Ser Leu Leu Trp Lys Ser Ser Ser Glu Ala Ile Arg
 20             25             30
Tyr Ser Met Pro Glu Glu Thr Glu Ser Gly Tyr Met Val Ala Asn Leu
 35             40             45
Ala Lys Asp Leu Gly Ile Arg Val Gly Glu Leu Ser Ser Arg Gly Ala
 50             55             60
Gln Ile His Tyr Lys Gly Asn Lys Glu Leu Leu Gln Leu Asp Ala Glu
 65             70             75             80
Thr Gly Asn Leu Phe Leu Lys Glu Lys Leu Asp Arg Glu Leu Leu Cys
 85             90             95
Gly Glu Thr Glu Pro Cys Val Leu Asn Phe Gln Ile Ile Leu Glu Asn
100            105            110
Pro Met Gln Phe Phe Gln Thr Glu Leu Gln Leu Thr Asp Ile Asn Asp
115            120            125
His Ser Pro Glu Phe Pro Asn Lys Lys Met Leu Leu Thr Ile Pro Glu
130            135            140
Ser Ala His Pro Gly Thr Val Phe Pro Leu Lys Ala Ala Arg Asp Ser
145            150            155            160
Asp Ile Gly Ser Asn Ala Val Gln Asn Tyr Thr Val Asn Pro Asn Leu
165            170            175
His Phe His Val Val Thr His Ser Arg Thr Asp Gly Arg Lys Tyr Pro
180            185            190
Glu Leu Val Leu Asp Arg Ala Leu Asp Arg Glu Glu Gln Pro Glu Leu
195            200            205
Thr Leu Ile Leu Thr Ala Leu Asp Gly Gly Ala Pro Ser Arg Ser Gly
210            215            220
Thr Thr Thr Val His Ile Glu Val Val Asp Ile Asn Asp Asn Ser Pro
225            230            235            240
Gln Phe Val Gln Ser Leu Tyr Lys Val Gln Val Pro Glu Asn Asn Pro
245            250            255
Leu Asn Ala Phe Val Val Thr Val Ser Ala Thr Asp Leu Asp Ala Gly
260            265            270

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Val Tyr Gly Asn Val Thr Tyr Ser Leu Phe Gln Gly Tyr Gly Val Phe  
 275 280 285  
 Gln Pro Phe Val Ile Asp Glu Ile Thr Gly Glu Ile His Leu Ser Lys  
 290 295 300  
 Glu Leu Asp Phe Glu Glu Ile Ser Asn His Asn Ile Glu Ile Ala Ala  
 305 310 315 320  
 Thr Asp Gly Gly Gly Leu Ser Gly Lys Cys Thr Val Ala Val Gln Val  
 325 330 335  
 Leu Asp Val Asn Asp Asn Ala Pro Glu Leu Thr Ile Arg Lys Leu Thr  
 340 345 350  
 Val Leu Val Pro Glu Asn Ser Ala Glu Thr Val Val Ala Val Phe Ser  
 355 360 365  
 Val Ser Asp Ser Asp Ser Gly Asp Asn Gly Arg Met Val Cys Ser Ile  
 370 375 380  
 Pro Asn Asn Ile Pro Phe Leu Leu Lys Pro Thr Phe Glu Asn Tyr Tyr  
 385 390 395 400  
 Thr Leu Val Thr Glu Gly Pro Leu Asp Arg Glu Asn Arg Ala Glu Tyr  
 405 410 415  
 Asn Ile Thr Ile Thr Val Ser Asp Leu Gly Thr Pro Arg Leu Thr Thr  
 420 425 430  
 Gln His Thr Ile Thr Val Gln Val Ser Asp Ile Asn Asp Asn Ala Pro  
 435 440 445  
 Ala Phe Thr Gln Thr Ser Tyr Thr Met Phe Val His Glu Asn Asn Ser  
 450 455 460  
 Pro Ala Leu His Ile Gly Thr Ile Ser Ala Thr Asp Ser Asp Ser Gly  
 465 470 475 480  
 Ser Asn Ala His Ile Thr Tyr Ser Leu Leu Pro Pro Asp Asp Pro Gln  
 485 490 495  
 Leu Ala Leu Asp Ser Leu Ile Ser Ile Asn Val Asp Asn Gly Gln Leu  
 500 505 510  
 Phe Ala Leu Arg Ala Leu Asp Tyr Glu Ala Leu Gln Ser Phe Glu Phe  
 515 520 525  
 Tyr Val Gly Ala Thr Asp Gly Gly Ser Pro Ala Leu Ser Ser Gln Thr  
 530 535 540  
 Leu Val Arg Met Val Val Leu Asp Asp Asn Asp Asn Ala Pro Phe Val  
 545 550 555 560  
 Leu Tyr Pro Leu Gln Asn Ala Ser Ala Pro Cys Thr Glu Leu Leu Pro  
 565 570 575  
 Arg Ala Ala Glu Pro Gly Tyr Leu Ile Thr Lys Val Val Ala Val Asp  
 580 585 590

Arg Asp Ser Gly Gln Asn Ala Trp Leu Ser Phe Gln Leu Leu Lys Ala  
 595 600 605  
 Thr Glu Pro Gly Leu Phe Ser Val Trp Ala His Asn Gly Glu Val Arg  
 610 615 620  
 Thr Thr Arg Leu Leu Ser Glu Arg Asp Ala Gln Lys His Lys Leu Leu  
 625 630 635 640  
 Leu Leu Val Lys Asp Asn Gly Asp Pro Leu Arg Ser Ala Asn Val Thr  
 645 650 655  
 Leu His Val Leu Val Val Asp Gly Phe Ser Gln Pro Tyr Leu Pro Leu  
 660 665 670  
 Ala Glu Val Ala Gln Asp Ser Met Gln Asp Asn Tyr Asp Val Leu Thr  
 675 680 685  
 Leu Tyr Leu Val Ile Ala Leu Ala Ser Val Ser Ser Leu Phe Leu Leu  
 690 695 700  
 Ser Val Val Leu Phe Val Gly Val Arg Leu Cys Arg Arg Ala Arg Glu  
 705 710 715 720  
 Ala Ser Leu Gly Asp Tyr Ser Val Pro Glu Gly His Phe Pro Ser His  
 725 730 735  
 Leu Val Asp Val Ser Gly Ala Gly Thr Leu Ser Gln Ser Tyr Gln Tyr  
 740 745 750  
 Glu Val Cys Leu Asn Gly Gly Thr Arg Thr Asn Glu Phe Asn Phe Leu  
 755 760 765  
 Lys Pro Leu Phe Pro Ile Leu Pro Thr Gln Ala Ala Ala Ala Glu Glu  
 770 775 780  
 Arg Glu Asn Ala Val Val His Asn Ser Val Gly Phe Tyr  
 785 790 795

(2) INFORMATION FOR SEQ ID NO:113:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 2347 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:113:

AAAACACGGG GGAAATGACA GTAGCAAAGA ATCTGGACTA TGAAGAATGC TCATTGTATG	60
AAATGGAAAT ACAGGCTGAA GATGTGGGGG CGCTTCTGGG GAGGAGCAAA GTGGTAATTA	120
TGGTAGAAGA TGTAATGAC AATCGGCCAG AAGTGACCAT TACATCCTTG TTTAACCCGG	180
TATTGGAAAA TTCTCTTCCC GGGACAGTAA TTGCCTTCTT GAATGTGCAT GACCGAGACT	240
CTGGAAAGAA CGGCCAAGTT GTCTGTTACA CGCATGATAA CTTACCTTTT AAATTAGAAA	300

AGTCAATAGA TAATTATTAT AGATTGGTGA CATGGAAATA TTTGGACCGA GAAAAAGTCT	360
CCATCTACAA TATCACAGTG ATAGCCTCAG ATCTAGGAGC CCACTCTGTC ACTGAAACTT	420
ACATTGCCCT GATTGTGGCA GACACTAATG ACAACCCTCC TCGTTTTCTT CACACCTCCT	480
ACACAGCCTA TATTCCAGAG AACAACTGA GGGGCGCCTC CATCTTCTCA CTGACTGCAC	540
ATGATCCTGA CAGTCAGGAA AATGCACAGG TCACTTACTC TGTGTCTGAG GACACCATAC	600
AGGGAGTGCC TTTGTCTCTT TATATCTCCA TCAACTCAGA TACTGGTGTG CTGTATGCAC	660
TGCACTCTTT TGACTTCGAG AAGATACAAG ACTTGCAGCT ACTGGTTGTT GCCACTGACA	720
GTGGAAGCCC ACCTCTCAGC AGCAATGTGT CATTGAGCTT GTTTGTGTG GACCAGAACG	780
ACAACGCACC TGAGATTCTA TATCCTAGCT TCCCCACAGA TGGCTCCACT GGTGTGGAAC	840
TAGCACCCCG CTCTGCAGAG CCTGGATACC TAGTGACCAA AGTGGTGGCA GTGGACAAAG	900
ACTCAGGACA GAATGCTTGG CTGTCTTACC GTCTGCTGAA GGCCAGCGAA CCTGGGCTCT	960
TCTCTGTAGG ACTTCACACG GGTGAGGTGC GTACAGCGAG GGCCCTGCTG GACAGAGATG	1020
CTCTCAAACA GAATCTGGTG ATGGCCGTGC AGGACCATGG CCAACCCCTT CTCTCGGCCA	1080
CTGTAACTCT CACTGTGGCA GTGGCTAACA GCATCCCTGA GGTGTTGGCT GACTTGAGCA	1140
GCATTAGGAC CCCTGGGGTA CCAGAGGATT CTGATATCAC GCTCCACCTG GTGGTGGCAG	1200
TGGCTGTGGT CTCCTGTGTC TTCCTTGTCT TTGTCATTGT CCTCCTAGCT CTCAGGCTTC	1260
AGCGCTGGCA GAAGTCTCGC CAGCTCCAGG GCTCCAAAGG TGGATTGGCT CCTGCACCTC	1320
CATCACATTT TGTGGGCATC GACGGGGTAC AGGCTTTTCT ACAAACCTAT TCTCATGAAG	1380
TCTCGCTCAC TTCAGGCTCC CAGACAAGCC ACATTATCTT TCCTCAGCCC AACTATGCAG	1440
ACATGCTCAT TAACCAAGAA GGCTGTGAGA AAAATGATTC CTTATTAACA TCCATAGATT	1500
TTCATGAGAG TAACCGTGAA GATGCTTGCG CCCCACAAGC CCCGCCAAC ACTGACTGGC	1560
GTTTCTCTCA AGCCCAGAGA CCCGGCACGA GCGGATCCCA AAATGGGGAT GAAACCGGCA	1620
CCTGGCCCAA CAACCAGTTC GATACAGAGA TGCTGCAAGC CATGATCTTG GCCTCTGCCA	1680
GTGAAGCCGC TGATGGGAGC TCCACTCTGG GAGGGGGCAC TGGCACTATG GGTGAGCG	1740
CTCGATATGG ACCCCAGTTT ACCCTGCAGC ACGTGCCTGA CTACCGCCAG AACGTGTACA	1800
TCCCTGGCAG CAATGCCACA CTGACCAACG CAGCTGGCAA ACGAGATGGC AAGGCTCCGG	1860
CAGGCGGCAA TGGCAACAAC AACAAAGTCGG GCAAGAAAGA GAAGAAGTAA TATGGAGGCC	1920
AGGCCTTGAG CCACAGGGCA GCCTCCCTCC CCAGCCAGTC CAGCTTGTCC TTAATTGTAC	1980
CCAGGCCTCA GAATTTTCAGG GCTCACCCCA GGATTCTGGT AGGAGCCACA GCCAGGCCAT	2040
GCTCCCCGTT GGGAAACAGA AACAAAGTGC CAAGCCAACA CCCCCTCTTT GTACCCTAGG	2100
GGGGTTGAAT ATGCAAAGAG AGTTCTGTG GGACCCCTTA TCCAATCAGT GATTGTACCC	2160

ACATAGGTAG CAGGGTTAGT GTGGATACAC ACACACACAC ACACACACAC ACACACACAA 2220  
 CCCTTGTCTT CCGCAGTGCC TGCCACTTTC TGGGACTTTC TCATCCCCCT ACGCCCTTCC 2280  
 TTTATCCTCT CCCACCCAGA CACAGCTGCT GGAGAATAAA TTTGGGGATG CTGATGCTAA 2340  
 AAAAAAA 2347

(2) INFORMATION FOR SEQ ID NO:114:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 2972 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 2..1849

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:114:

A GAG GCT GCT CAC CAC CTG GTC CTC ACG GCC TCG GAT GGC GGC AAG 46  
 Glu Ala Ala His His Leu Val Leu Thr Ala Ser Asp Gly Gly Lys  
 1 5 10 15

CCG CCT CGC TCT AGC ACA GTG CGC ATC CAC GTG ACA GTG TTG GAT ACA 94  
 Pro Pro Arg Ser Ser Thr Val Arg Ile His Val Thr Val Leu Asp Thr  
 20 25 30

AAT GAC AAT GCC CCG GTT TTT CCT CAC CCG ATT TAC CGA GTG AAA GTC 142  
 Asn Asp Asn Ala Pro Val Phe Pro His Pro Ile Tyr Arg Val Lys Val  
 35 40 45

CTT GAG AAC ATG CCC CCA GGC ACG CGG CTG CTT ACT GTA ACA GCC AGC 190  
 Leu Glu Asn Met Pro Pro Gly Thr Arg Leu Leu Thr Val Thr Ala Ser  
 50 55 60

GAC CCG GAT GAG GGA ATC AAC GGA AAA GTG GCA TAC AAA TTC CGG AAA 238  
 Asp Pro Asp Glu Gly Ile Asn Gly Lys Val Ala Tyr Lys Phe Arg Lys  
 65 70 75

ATT AAT GAA AAA CAA ACT CCG TTA TTC CAG CTT AAT GAA AAT ACT GGG 286  
 Ile Asn Glu Lys Gln Thr Pro Leu Phe Gln Leu Asn Glu Asn Thr Gly  
 80 85 90 95

GAA ATA TCA ATA GCA AAA AGT CTA GAT TAT GAA GAA TGT TCA TTT TAT 334  
 Glu Ile Ser Ile Ala Lys Ser Leu Asp Tyr Glu Glu Cys Ser Phe Tyr  
 100 105 110

GAA ATG GAA ATA CAA GCC GAA GAT GTG GGG GCA CTT CTG GGG AGG ACC 382  
 Glu Met Glu Ile Gln Ala Glu Asp Val Gly Ala Leu Leu Gly Arg Thr  
 115 120 125

AAA TTG CTC ATT TCT GTG GAA GAT GTA AAT GAC AAT AGA CCA GAA GTG 430  
 Lys Leu Leu Ile Ser Val Glu Asp Val Asn Asp Asn Arg Pro Glu Val  
 130 135 140



ATC ATT ACG TCT TTG TTT AGC CCA GTG TTA GAA AAT TCT CTT CCC GGG Ile Ile Thr Ser Leu Phe Ser Pro Val Leu Glu Asn Ser Leu Pro Gly 145 150 155	478
ACA GTA ATT GCC TTC TTG AGT GTG CAT GAC CAA GAC TCT GGA AAG AAT Thr Val Ile Ala Phe Leu Ser Val His Asp Gln Asp Ser Gly Lys Asn 160 165 170 175	526
GGT CAA GTT GTC TGT TAC ACA CGT GAT AAT TTA CCT TTT AAA TTA GAA Gly Gln Val Val Cys Tyr Thr Arg Asp Asn Leu Pro Phe Lys Leu Glu 180 185 190	574
AAG TCA ATA GGT AAT TAT TAT AGA TTA GTG ACA AGG AAA TAT TTG GAC Lys Ser Ile Gly Asn Tyr Tyr Arg Leu Val Thr Arg Lys Tyr Leu Asp 195 200 205	622
CGA GAA AAT GTC TCT ATC TAC AAT ATC ACA GTG ATG GCC TCA GAT CTA Arg Glu Asn Val Ser Ile Tyr Asn Ile Thr Val Met Ala Ser Asp Leu 210 215 220	670
GGA ACA CCA CCT CTG TCC ACT GAA ACT CAA ATC GCT CTG CAC GTG GCA Gly Thr Pro Pro Leu Ser Thr Glu Thr Gln Ile Ala Leu His Val Ala 225 230 235	718
GAC ATT AAC GAC AAC CCT CCT ACT TTC CCT CAT GCC TCC TAC TCA GCG Asp Ile Asn Asp Asn Pro Pro Thr Phe Pro His Ala Ser Tyr Ser Ala 240 245 250 255	766
TAT ATC CTA GAG AAC AAC CTG AGA GGA GCC TCC ATC TTT TCC TTG ACT Tyr Ile Leu Glu Asn Asn Leu Arg Gly Ala Ser Ile Phe Ser Leu Thr 260 265 270	814
GCA CAC GAC CCC GAC AGC CAG GAG AAT GCC CAG GTC ACT TAC TCT GTG Ala His Asp Pro Asp Ser Gln Glu Asn Ala Gln Val Thr Tyr Ser Val 275 280 285	862
ACC GAG GAC ACG CTG CAG GGG GCG CCC CTG TCC TCG TAT ATC TCC ATC Thr Glu Asp Thr Leu Gln Gly Ala Pro Leu Ser Ser Tyr Ile Ser Ile 290 295 300	910
AAC TCT GAC ACC GGT GTC CTG TAT GCG CTG CAA TCT TTC GAC TAT GAG Asn Ser Asp Thr Gly Val Leu Tyr Ala Leu Gln Ser Phe Asp Tyr Glu 305 310 315	958
CAG ATC CGA GAC CTG CAG CTA CTG GTA ACA GCC AGC GAC AGC GGG GAC Gln Ile Arg Asp Leu Gln Leu Leu Val Thr Ala Ser Asp Ser Gly Asp 320 325 330 335	1006
CCG CCC CTC AGC AGC AAC ATG TCA CTG AGC CTG TTC GTG CTG GAC CAG Pro Pro Leu Ser Ser Asn Met Ser Leu Ser Leu Phe Val Leu Asp Gln 340 345 350	1054
AAT GAC AAC GCG CCC GAG ATC CTG TAC CCC GCC CTC CCC ACA GAC GGT Asn Asp Asn Ala Pro Glu Ile Leu Tyr Pro Ala Leu Pro Thr Asp Gly 355 360 365	1102
TCC ACT GGC GTG GAG CTG GCG CCC CGC TCC GCA GAG CGT GGC TAC CTG Ser Thr Gly Val Glu Leu Ala Pro Arg Ser Ala Glu Arg Gly Tyr Leu 370 375 380	1150

GTG ACC AAG GTG GTG GCG GTG GAC AGA GAC TCG GGC CAG AAC GCC TGG Val Thr Lys Val Val Ala Val Asp Arg Asp Ser Gly Gln Asn Ala Trp 385 390 395	1198
CTG TCC TAC CGC CTG CTC AAG GCC AGC GAG CCG GGA CTC TTC TCG GTG Leu Ser Tyr Arg Leu Leu Lys Ala Ser Glu Pro Gly Leu Phe Ser Val 400 405 410 415	1246
GGT CTG CAC ACG GGC GAG GTG CGC ACG GCG CGA GCC CTG CTG GAC AGA Gly Leu His Thr Gly Glu Val Arg Thr Ala Arg Ala Leu Leu Asp Arg 420 425 430	1294
GAC GCG CTC AAG CAG AGC CTC GTG GTG GCC GTC CAG GAC CAT GGC CAG Asp Ala Leu Lys Gln Ser Leu Val Val Ala Val Gln Asp His Gly Gln 435 440 445	1342
CCC CCT CTC TCC GCC ACT GTC ACG CTC ACC GTA GCC GTG GCT GAC AGC Pro Pro Leu Ser Ala Thr Val Thr Leu Thr Val Ala Val Ala Asp Ser 450 455 460	1390
ATC CCC GAA GTC CTG ACC GAG TTG GGC AGT CTG AAG CCT TCG GTC GAC Ile Pro Glu Val Leu Thr Glu Leu Gly Ser Leu Lys Pro Ser Val Asp 465 470 475	1438
CCG AAC GAT TCG AGC CTT ACA CTC TAT CTC GTG GTG GCA GTG GCT GCC Pro Asn Asp Ser Ser Leu Thr Leu Tyr Leu Val Val Ala Val Ala Ala 480 485 490 495	1486
ATC TCC TGT GTC TTC CTC GCC TTT GTC GCT GTG CTT CTG GGG CTC AGG Ile Ser Cys Val Phe Leu Ala Phe Val Ala Val Leu Leu Gly Leu Arg 500 505 510	1534
CTG AGG CGC TGG CAC AAG TCA CGC CTG CTC CAG GAT TCC GGT GGC AGA Leu Arg Arg Trp His Lys Ser Arg Leu Leu Gln Asp Ser Gly Gly Arg 515 520 525	1582
TTG GTA GGC GTG CCT GCC TCA CAT TTT GTG GGT GTT GAG GAG GTA CAG Leu Val Gly Val Pro Ala Ser His Phe Val Gly Val Glu Glu Val Gln 530 535 540	1630
GCT TTC CTG CAG ACC TAT TCC CAG GAA GTC TCC CTC ACC GCC GAC TCG Ala Phe Leu Gln Thr Tyr Ser Gln Glu Val Ser Leu Thr Ala Asp Ser 545 550 555	1678
CGG AAG AGT CAC CTG ATC TTT CCC CAG CCC AAC TAC GCA GAC ATG CTC Arg Lys Ser His Leu Ile Phe Pro Gln Pro Asn Tyr Ala Asp Met Leu 560 565 570 575	1726
ATC AGT CAG GAG GGC TGT GAG AAA AAT GAT TCT TTG TTA ACA TCC GTA Ile Ser Gln Glu Gly Cys Glu Lys Asn Asp Ser Leu Leu Thr Ser Val 580 585 590	1774
GAT TTT CAT GAA TAT AAG AAT GAA GCT GAT CAT GGT CAG GTG AGT TTA Asp Phe His Glu Tyr Lys Asn Glu Ala Asp His Gly Gln Val Ser Leu 595 600 605	1822
GTT CTT TGC TTG CTT TTA ATT TCC AGA TGAATTTTAT TTGGCATAAA Val Leu Cys Leu Leu Leu Ile Ser Arg 610 615	1869

TTATGTTTTG AAAAACATTG TGAAGATAGT TGAAAATAAT TTTTAAGGTG TATCACAGAG 1929  
 TTTTGGGTTT ATTTTGGTGG TGTTACCAA AAATTGAACT CTAATAGTCA TAGGTTATTG 1989  
 TTTCATTTGC TTTTAAACGA CTTGGAAAAG ATTGTTCCAC CATTTTAAAC CTTCCAGTAT 2049  
 TTTATTCCCTA TTATCACTCA TTCACTTAAG AAGTAGCTAC CCGTCCATAC TGGTAATTTT 2109  
 GCTATTGTTT GTTTGTGTGT GTGTGTGTGT GTGTGTGTGT GTGTGTGTAT CCCAACTAG 2169  
 AACTTCAGAA AATTATCAAG AAGTCTAAAG CCTTGTTATT AGCTTAGCAA AAGTAAAATA 2229  
 TATCTCAGAA TTTTtagggt TATGTTTAGC ATTTGAACCT GTAAGTAGGC TCTTGATAT 2289  
 TTCTTCACTT TAAACCTCTT TTCTGAGCCC TGTTCCTGTA CCAGTGCCCT TCAAACTTT 2349  
 AATACTTCTT ACCATCCTTC AAAACATGAA CAAACTTTAA AGATGGATCT TGGTGGGAGA 2409  
 TGAGACTGGT TACTAAATAT TAAGTATGTG AGTCAGTGGT CACCTGGGCT CCATCCCCAT 2469  
 GGAGACATGA AATCTAAAGC CTAGAATGTC CATTGCTCCC CCAAACAAA AACAAAAGCA 2529  
 AAAACATTAG ATCTGAATTA AAATGTAATT TTAACTGTT GAAAGTGAAT TTTGTAAAT 2589  
 ATGTAAGAAC ATATTTCAAT ACAATTCAA TTAGCTGTTT CGGTTGTGCA TTGATGTGAA 2649  
 GTGGTGAGAA TGTGATATT AAGAACCAAT GTTTCAGGTA CACAAGTTCT AAATAAGCTG 2709  
 ATCAATTCAA TTAAAGTTAT TCAGTCTTGG CTGGACACAG TGCCTCATGT CTGAAATCCC 2769  
 AGCACTTTGG GAGGCTGGGG CAGGAGGACC GCTTGAGCCC CGGGGGTTTG AACTGCAGT 2829  
 GAGCTATGAT CATGCCACTG CACTCCAGCC TAGGTGGCAG AACTAGACCC TGTCTCTAAA 2889  
 AAAACTATTA TTAGGCCGCG TGCGGTGGCT CACGCCTGTA ATCCCAGCAC TTTGGGAGAC 2949  
 TGAGGTGGGT GGATCACCTG AGC 2972

(2) INFORMATION FOR SEQ ID NO:115:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 616 amino acids
  - (B) TYPE: amino acid
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:115:

Glu Ala Ala His His Leu Val Leu Thr Ala Ser Asp Gly Gly Lys Pro  
 1 5 10 15  
 Pro Arg Ser Ser Thr Val Arg Ile His Val Thr Val Leu Asp Thr Asn  
 20 25 30  
 Asp Asn Ala Pro Val Phe Pro His Pro Ile Tyr Arg Val Lys Val Leu  
 35 40 45  
 Glu Asn Met Pro Pro Gly Thr Arg Leu Leu Thr Val Thr Ala Ser Asp  
 50 55 60

Pro Asp Glu Gly Ile Asn Gly Lys Val Ala Tyr Lys Phe Arg Lys Ile  
 65 70 75 80  
 Asn Glu Lys Gln Thr Pro Leu Phe Gln Leu Asn Glu Asn Thr Gly Glu  
 85 90 95  
 Ile Ser Ile Ala Lys Ser Leu Asp Tyr Glu Glu Cys Ser Phe Tyr Glu  
 100 105 110  
 Met Glu Ile Gln Ala Glu Asp Val Gly Ala Leu Leu Gly Arg Thr Lys  
 115 120 125  
 Leu Leu Ile Ser Val Glu Asp Val Asn Asp Asn Arg Pro Glu Val Ile  
 130 135 140  
 Ile Thr Ser Leu Phe Ser Pro Val Leu Glu Asn Ser Leu Pro Gly Thr  
 145 150 155 160  
 Val Ile Ala Phe Leu Ser Val His Asp Gln Asp Ser Gly Lys Asn Gly  
 165 170 175  
 Gln Val Val Cys Tyr Thr Arg Asp Asn Leu Pro Phe Lys Leu Glu Lys  
 180 185 190  
 Ser Ile Gly Asn Tyr Tyr Arg Leu Val Thr Arg Lys Tyr Leu Asp Arg  
 195 200 205  
 Glu Asn Val Ser Ile Tyr Asn Ile Thr Val Met Ala Ser Asp Leu Gly  
 210 215 220  
 Thr Pro Pro Leu Ser Thr Glu Thr Gln Ile Ala Leu His Val Ala Asp  
 225 230 235 240  
 Ile Asn Asp Asn Pro Pro Thr Phe Pro His Ala Ser Tyr Ser Ala Tyr  
 245 250 255  
 Ile Leu Glu Asn Asn Leu Arg Gly Ala Ser Ile Phe Ser Leu Thr Ala  
 260 265 270  
 His Asp Pro Asp Ser Gln Glu Asn Ala Gln Val Thr Tyr Ser Val Thr  
 275 280 285  
 Glu Asp Thr Leu Gln Gly Ala Pro Leu Ser Ser Tyr Ile Ser Ile Asn  
 290 295 300  
 Ser Asp Thr Gly Val Leu Tyr Ala Leu Gln Ser Phe Asp Tyr Glu Gln  
 305 310 315 320  
 Ile Arg Asp Leu Gln Leu Leu Val Thr Ala Ser Asp Ser Gly Asp Pro  
 325 330 335  
 Pro Leu Ser Ser Asn Met Ser Leu Ser Leu Phe Val Leu Asp Gln Asn  
 340 345 350  
 Asp Asn Ala Pro Glu Ile Leu Tyr Pro Ala Leu Pro Thr Asp Gly Ser  
 355 360 365  
 Thr Gly Val Glu Leu Ala Pro Arg Ser Ala Glu Arg Gly Tyr Leu Val  
 370 375 380

Thr Lys Val Val Ala Val Asp Arg Asp Ser Gly Gln Asn Ala Trp Leu  
 385 390 395 400  
 Ser Tyr Arg Leu Leu Lys Ala Ser Glu Pro Gly Leu Phe Ser Val Gly  
 405 410 415  
 Leu His Thr Gly Glu Val Arg Thr Ala Arg Ala Leu Leu Asp Arg Asp  
 420 425 430  
 Ala Leu Lys Gln Ser Leu Val Val Ala Val Gln Asp His Gly Gln Pro  
 435 440 445  
 Pro Leu Ser Ala Thr Val Thr Leu Thr Val Ala Val Ala Asp Ser Ile  
 450 455 460  
 Pro Glu Val Leu Thr Glu Leu Gly Ser Leu Lys Pro Ser Val Asp Pro  
 465 470 475 480  
 Asn Asp Ser Ser Leu Thr Leu Tyr Leu Val Val Ala Val Ala Ala Ile  
 485 490 495  
 Ser Cys Val Phe Leu Ala Phe Val Ala Val Leu Leu Gly Leu Arg Leu  
 500 505 510  
 Arg Arg Trp His Lys Ser Arg Leu Leu Gln Asp Ser Gly Gly Arg Leu  
 515 520 525  
 Val Gly Val Pro Ala Ser His Phe Val Gly Val Glu Glu Val Gln Ala  
 530 535 540  
 Phe Leu Gln Thr Tyr Ser Gln Glu Val Ser Leu Thr Ala Asp Ser Arg  
 545 550 555 560  
 Lys Ser His Leu Ile Phe Pro Gln Pro Asn Tyr Ala Asp Met Leu Ile  
 565 570 575  
 Ser Gln Glu Gly Cys Glu Lys Asn Asp Ser Leu Leu Thr Ser Val Asp  
 580 585 590  
 Phe His Glu Tyr Lys Asn Glu Ala Asp His Gly Gln Val Ser Leu Val  
 595 600 605  
 Leu Cys Leu Leu Leu Ile Ser Arg  
 610 615